FLIGHT

MAGAZINE

JULY 1958

50 cents

V47 #7

PUBLIC LIBRARY
JUL 21 1958
DETROIT

PACAERO LEARSTAR

See page 21

CHARTER
LEASE
PURCHASE

Which one fits your business?

It's no news to you that today's markets are the hardest in ten years. Yet despite cautious corporate spending . . more Bells are being chartered, leased or purchased in 1958 than at any time in history. Why?

Corporations have had to trim both executive and sales forces. Remaining men must now handle more jobs, cover more territories, service more customers. Ground travel is too slow, and ordinary air travel is still dependent on airports and schedules, subject to quirks of weather. The versatile Bell, with its door-to-door flight plan, jumps off anywhere, anytime . . lands at will, refuels at a highway gas pump.

We'll say flatly (with hundreds of Bell-user reports for backing) that the Bell *will save your company money* . . plenty of it . . if: (1) Your key men in administration, production, engineering or sales make frequent trips into your operating territories; (2) Your best salesmen have difficulty covering out-of-the-way markets; (3) Your satellite plants demand regular visits from headquarters.

Like to find out for yourself? The way is open . . through CHARTER, LEASE OR PURCHASE.* Simply write us today, Bell Helicopter Corporation, Dept. 12G, Fort Worth, Texas. We'll send you the full story, promptly.

Watch "WHIRLYBIRDS" on TV . . . consult your local paper for time and station.

There are some 100 Charter Helicopter Services in the U.S. . . . write us for their names.

BELL Helicopter CORPORATION

Subsidiary of Bell Aircraft Corporation

FORT WORTH, TEXAS

*Prices Start at $39,500

WE'VE HUNG OUT OUR SHINGLE ACROSS THE LAND

(The "Sign of Service" wherever planes land!)

In a host of airports across the length and breadth of this country, you'll see this famous "shingle" which denotes the headquarters of skilled men who are true professionals when it comes to servicing America's huge fleet of civil aircraft.

It's the Goodyear "Sign of Service"—service that has grown and kept pace with the phenomenal growth of private aviation.

This growth—and the acceptance it enjoys among flying consumers—is not due to "bigness" alone.

It has become the largest service network in the nation for reasons well known to the thousands of civil aircraft operators it serves each year.

Reasons like the way fair play is a must with airport dealers who fly this sign; like the fact that strategically located distribution points assure these men complete stocks of the things you need; like the foremost quality of the parts they carry; like the skills and workmanship of the mechanics who put this service into practice.

In short, it's the sign of a man with a reputation for dependability—backed by a complete line of parts that are tops in the aviation field. So, taxi on over and sample some *real* service!

Goodyear Aviation Products Distributors

AIR-PARTS INTERNATIONAL *Burbank, Cal.—New York, N. Y.*

PIEDMONT AVIATION, INC.
Winston-Salem, N. C.—Norfolk, Va.

VAN DUSEN AIRCRAFT SUPPLIES *Minneapolis, Minn.*
East Boston, Mass.—Miami, Fla.—Teterboro, N. J.
Chicago, Ill.—Richmond, Va.—Alexandria, Va.

GENERAL AVIATION SUPPLY COMPANY *Houston, Tex.*
Phoenix, Ariz.—Dallas, Tex.—Oklahoma City, Okla.
St. Louis, Mo.

SKY SUPPLY *P.O. Box 873, Helena, Mont.*

STANDARD PRODUCTS, INC. *Wichita, Kans.*
Tulsa, Okla.—Kansas City, Kans.

DENVER AIRPLANE SUPPLY
Stapleton Airfield, Denver, Colo.

THE DON HORN COMPANY
Municipal Airport, Memphis, Tenn.

ATLANTIC AVIATION SERVICE, INC.
Box 1709, Wilmington, Delaware

STANDARD AIRCRAFT EQUIPMENT COMPANY, INC.
P.O. Box 271, Mineola, Long Island, N. Y.

Modern Air Headquarters for Mid-America

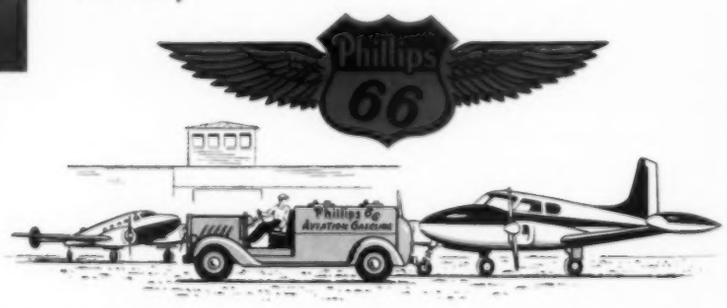
Spearheading Executive's growth to its present position as the leading fixed-base operator in the Kansas City area have been Virgil W. Hackett, president (left), and William T. (Bill) Todd, service director.

Executive's smart, comfortable lounge for incoming and departing air travelers. Sandwich and snack service, plus free coffee, help make this stop a pleasant one. Executive is dealer for Cessna Aircraft in Western Missouri and Eastern Kansas.

● More and more pilots of private and business planes are learning every month that the place to stop in Kansas City is Executive Aircraft Company. Their new modern facilities are now located on the west side of Kansas City Municipal Airport, only five minutes from downtown Kansas City, Missouri.

Executive's huge new hangar is equipped with modern infra-red heaters for fast de-icing of airplanes. Executive's new offices include two large air-conditioned lounges with hi-fi. Free station wagon service to the terminal is available 24 hours a day, and a fully equipped radio shop is maintained. With over 35 highly trained people on its staff, including nine A & E mechanics, Executive is equipped to give service—and does!

Mr. Virgil Hackett, president, says, "In keeping with our policy of offering our customers the most modern and best services, we provide them with Phillips *66* Aviation Gasoline exclusively."



AVIATION DIVISION • PHILLIPS PETROLEUM COMPANY • BARTLESVILLE, OKLAHOMA

AIR Report

Significant Trends and News

CAA IS STREAMLINING STC PROCEDURES in answer to nationwide demand from operators for relief from burdensome requirements. Operators still have fingers crossed but CAA release says its new procedures are aimed at simplifying and speeding the issuance of supplemental type certificates (STC) following aircraft modifications. Certain immediate changes will be followed up by a longer-range program of regulatory and other policy changes. CAA lists the immediate changes as follows: (1) Increase emphasis on proper appointment, training, supervision and numbers of Designated Engineering Representatives (DER) in the STC program; (2) permit the DER to approve data and obtain STC without initial review by CAA, post review will be made, this will permit local inspector to release the aircraft after his conformity inspection; (3) authorize direct communication of technical information by CAA Engineering Service Representatives and field CAA Aircraft Maintenance Inspectors, to eliminate where possible the time-consuming exchange of this information by mail; (4) increase responsibility of DER's to conduct compliance inspections, permitting obtaining of STC number by telephone from CAA regional headquarters; (5) assign more engineers to STC duties when necessary to meet workload; (6) reiterate the definition of "repair" as the "process of returning an aircraft to its original airworthiness specifications and standards" and making clear that none of this work will require STC approval; (7) establish the CAA Aircraft Maintenance Inspector as the primary representative in the field who will determine when an aircraft can be returned to service without engineering approval. (See editorial on page 17.)

A 250-HP. TURBINE ENGINE FOR LIGHTPLANES AND HELICOPTERS will be developed by Allison Division of General Motors on a contract for the Air Force and Army, Allison winning a design competition among several engine manufacturers. Propjet and turbo-shaft versions will be developed, the turboprop weighing only 106 lbs. and less than 39 ins. long. The shafted version will weigh only 90 lbs. and will be less than 35 ins. long. The shafted engine will be for helicopters, marine installations and as auxiliary power plant use. Allison says military and commercial twin jet lightplanes powered by the Allison Model 250 propjet "will be able to reach speeds over 300 mph.," and the basic design will be so simple that all major components can be removed and replaced with hand tools found in most toolboxes.

FIRST PRODUCTION ORDER FOR SMALL PROPJET ENGINES has gone to Lycoming for $6,000,000 worth of 960-shp. Lycoming T-53L-3 engines with deliveries in November, 1958. First application for the engine is in the Army's new twin-engine Grumman AO-1 Mohawk STOL observation plane. Lycoming recently received a $10,000,000 production order for 860-shp. T-53L-1 shafted versions of the engine for helicopters. The propjet engine weighs 495 lbs., is 58.85 ins. long and has a 23-in. diameter.

LYCOMING's FIRST FUEL-INJECTED ENGINE is an MO-360-A1A version of the 180-hp. 0-360-A1A used in the Beech Travel Air, Piper Comanche and Mooney Mark 20A. Weight was lowered from 285 to 251 lbs. without loss of power and fuel injection eliminates the carburetor and reduces the engine's height from 24.68 inches to only 17.47 inches. It will power a reconnaissance drone designed for the Army by Rheem Manufacturing Co.

FULL PRODUCTION OF 1,050-SHP. GENERAL ELECTRIC T-58 TURBOSHAFT ENGINES NEXT YEAR will result from Air Force release of $3,800,000 for production facilities and tooling. Weighing only 271

(Continued on page 48)

FLIGHT MAGAZINE

JULY, 1958 VOL. 47, No. 7

THIS MONTH'S COVER is a portrait of the PacAero Learstar, the widely-used 10-12-place, 290-mph., long-range conversion for Lockheed Lodestars. CAA-certificated under Part O4b for air transports, its performance is guaranteed to meet air transport category requirements. For details, see page 21.

Air Report—SIGNIFICANT TRENDS AND NEWS 5

Just Among Ourselves—EDITORIALS: PROMISED STC RELIEF; PRIVATE PILOT REQUIREMENTS; A CIVIL AERONAUTICS ACT OF 1958; PILOT FACTOR VS. PILOT ERROR 17

Flight Magazine Salutes—DESERVED RECOGNITION 18

The Learstar Story—BY GEORGE E. HADDAWAY—LEARSTAR SUCCESS EXEMPLIFIES PACAERO'S WIDE-RANGE PROGRAM 21

Reading Tops Again—OUTSTANDING AIRCRAFT WIN READING AVIATION SERVICE AWARDS 24

Wilderness Air Strip—AIRLIFTED BULLDOZERS AT WORK . . . 27

Push-Button Flight With Lear L-5—LIFE System—BY TOM ASHLEY—PRECISION IFR FLYING THE SMOOTH, NATURAL WAY 28

Victory Over Auto Traffic—COMPANY COPTER CROSSES LOS ANGELES EIGHT TIMES DAILY IN MINUTES 32

Alti-Cruiser Shakedown Cruise—BY TED R. SMITH—FIRST PRESSURIZED TWIN'S INITIAL TRIP BY MAN WHO PERFECTED IT . 35

Sikorsky's New S-62—TURBINE POWER AND FLYING-BOAT HULL . 38

Airmen's Calendar—COMING EVENTS 42

New Business in the Hangar—NATIONWIDE ROUNDUP OF INTERESTING DEVELOPMENTS IN BUSINESS FLYING 56

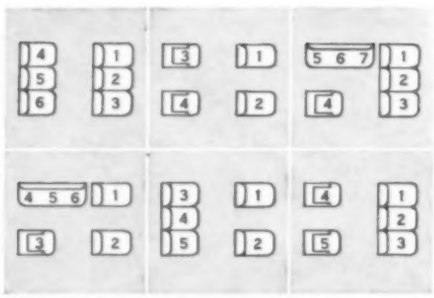
GEORGE E. HADDAWAY, Editor-Publisher; TOM ASHLEY, Managing Editor; FRED N. STONES, JR., Business Manager; LOUISE ROBERTSON, Circulation; E. H. PICKERING, Consultant; P. O. Box 750 (2700 N. Haskell Ave.), Dallas, Texas — Telephone TAylor 3-6191.

FLIGHT MAGAZINE, July, 1958, Vol. 47, No. 7. Published Monthly. Publication Office, P. O. Box 750 (2700 N. Haskell Ave.), Dallas, Texas. Price 50c single copy. Subscription rates: United States, one year, $3.00; two years, $5.00; three years, $6.00. Established February, 1934. Entered second-class matter at the Post Office, Dallas, under the act of March 3, 1879.

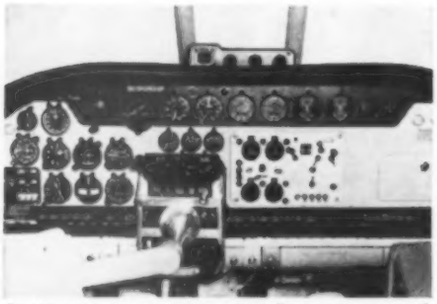
Copyright, 1958, by Air Review Publishing Corporation.

Wouldn't you, too, like to step-up to this 4-mile-a-minute Twin-Bonanza?

Executive Pilots: How To "Check-Fly" The Beechcraft Twin-Bonanza This Month:



Six seating arrangements, for 4 to 7 persons, lets your company choose the one that fits its travel needs best.



Instruments conveniently grouped and edge-lighted, lots of room for radios, makes Twin-Bonanza flying easier.

The best way to get to know any airplane is to fly it—and your Beechcraft distributor or dealer invites you to call him this month to "check fly" the Twin-Bonanza.

You open the throttles, and almost before you know it, you are airborne, climbing swiftly at 1,600 feet per minute. As the minutes flit by, you discover that the Twin-Bonanza has more of the advantages you want in an all-weather airplane than any other twin in its class:

1. Power to spare. With 340 h.p. supercharged engines, you clear 50-ft. obstacles in less than 1,300 ft.

2. More speed. You cruise at 228 miles an hour with 70% power.

3. Higher service ceiling of 24,800 feet lets you stay well above mountains and weather.

4. Longer range — up to 1,650 miles without refueling.

5. More strength—the only airplane in its class designed and tested for 8G load factor.

And that's only part of it. There's more, much more, to discover. Why not do it soon, at your Beechcraft distributor's or dealer's?

For information about the **Twin-Bonanza** and the finest leasing and financing plans in aviation, see your Beechcraft distributor or dealer, or write Beech Aircraft Corporation, Wichita 1, Kansas, U. S. A.

Beechcraft

SUPER 18 TWIN-BONANZA BONANZA TRAVEL AIR

BEECHCRAFTS ARE THE AIR FLEET OF AMERICAN BUSINESS

This 4-place Beechcraft Bonanza, with a non-stop range of over 1,000 miles, cruises at 200 miles an hour, yet uses less fuel than your family car.

Your Beechcraft distributor or dealer invites you to . . .

Take The Wheel And Discover These 10 Advantages Of The '58 Bonanza:

New! Fuel injection, a Bonanza exclusive, gives more speed, easier starting in all temperatures, ends carburetor icing!

6 large tinted glass windows, plus low wing design, gives you excellent visibility, even in tight-pattern turns.

What's it like to fly a 1958 Beechcraft Bonanza? Here's your chance to find out and, at the same time, discover more about a number of distinct reasons for owning a new Bonanza:

1. 30 mph higher speed than any other single-engine commercial airplane.

2. Lower fuel cost per mile.

3. Fast-retracting tricycle landing gear, proven by millions of landings.

4. Stronger construction — the only single-engine business plane licensed in the Utility category at full gross weight.

5. Longer cruising range — up to 1,060 miles non-stop.

6. Higher rate of climb — 1,250 feet per minute.

7. Higher service ceiling — 21,300 feet.

8. Shorter take-offs — 940 ft. over 50-ft. obstacle, no wind.

9. Shorter landings — 1,130 ft. over 50-ft. obstacle, no wind.

10. Higher payload with full tanks—830 pounds.

See your Beechcraft distributor or dealer this month. Accept his invitation to fly the 1958 Bonanza!

For information about the **Bonanza** and the finest leasing and financing plans in aviation, see your Beechcraft distributor or dealer, or write Beech Aircraft Corporation, Wichita 1, Kansas, U. S. A.

Beechcraft

BEECHCRAFTS ARE THE AIR FLEET OF AMERICAN BUSINESS

OPP

FLYTE

A NEW NAME IN GROUND, AIRBORNE COMMUNICATIONS AND NAVIGATIONAL EQUIPMENT.

"TOPPER" 6 CHANNEL VHF TRANSCEIVER

THE COMMUNICATIONS DIVISION of TOPP is developing a complete new line of ground, airborne communications and navigational equipment for civilian aircraft. These products represent the combined skills and know-how of Topp's outstanding engineering, production and quality control organization. The first of these is the "TOPPER", an emergency stand-by transceiver for use in single and multi-engine aircraft, as well as airport vehicles. The transmitter-receiver, power supply and modulator are contained in a small compact package weighing less than 5 pounds.

See this unit at your distributor or dealer, or wire, phone or write to:

COMMUNICATIONS DIVISION

TOPP MANUFACTURING COMPANY

A DIVISION OF TOPP INDUSTRIES, INC.

10200 AVIATION BLVD., LOS ANGELES 45, CALIF.

OREGON 8-0451

The first approved oils for jet age airlines

A new era in aviation is unfolding—turbo-jet airliners are joining our commercial airline routes. Esso is especially proud that its Turbo Oil 15 was the *first* to be approved for use in the new Pratt & Whitney jet engines . . . and that Esso Turbo Oil 35 was the *first* to be approved for the new Allison Turbo-prop engines.

A decade ago, Esso Research anticipated the need for a new synthetic lubricant for aircraft turbine engines. Working with American and British designers and manufacturers, Esso Turbo Oils 15 and 35 were developed. Because these synthetic lubricants were used by manufacturers of jet engines in the development and testing of these new engines, they are thoroughly time tested and performance proved.

Esso Turbo Oils 15 and 35 were the *first* turbo oils to be approved by manufacturers of the following commercial turbo-jet and turbo-prop engines:

TURBO OIL 15

Pratt & Whitney JT-3 and JT-4.....Boeing 707 • DC-8

TURBO OIL 35

Allison 501.....Lockheed Electra

Rolls Royce Dart.....Vickers Viscount • Fairchild F-27

Rolls Royce Conway.....Boeing 707 • Douglas DC-8

Rolls Royce Avon.....Sud-Aviation • Caravelle
DeHavilland Comet IV

Bristol Proteus 755 .....Bristol Britannia

You can depend on Esso—*first* in quality and in service!

TURBO OILS

ESSO

ESSO RESEARCH works wonders with oil

Vought Vocabulary

e·con′o·my: *when round-trip missiles save taxpayers $102,950,000*

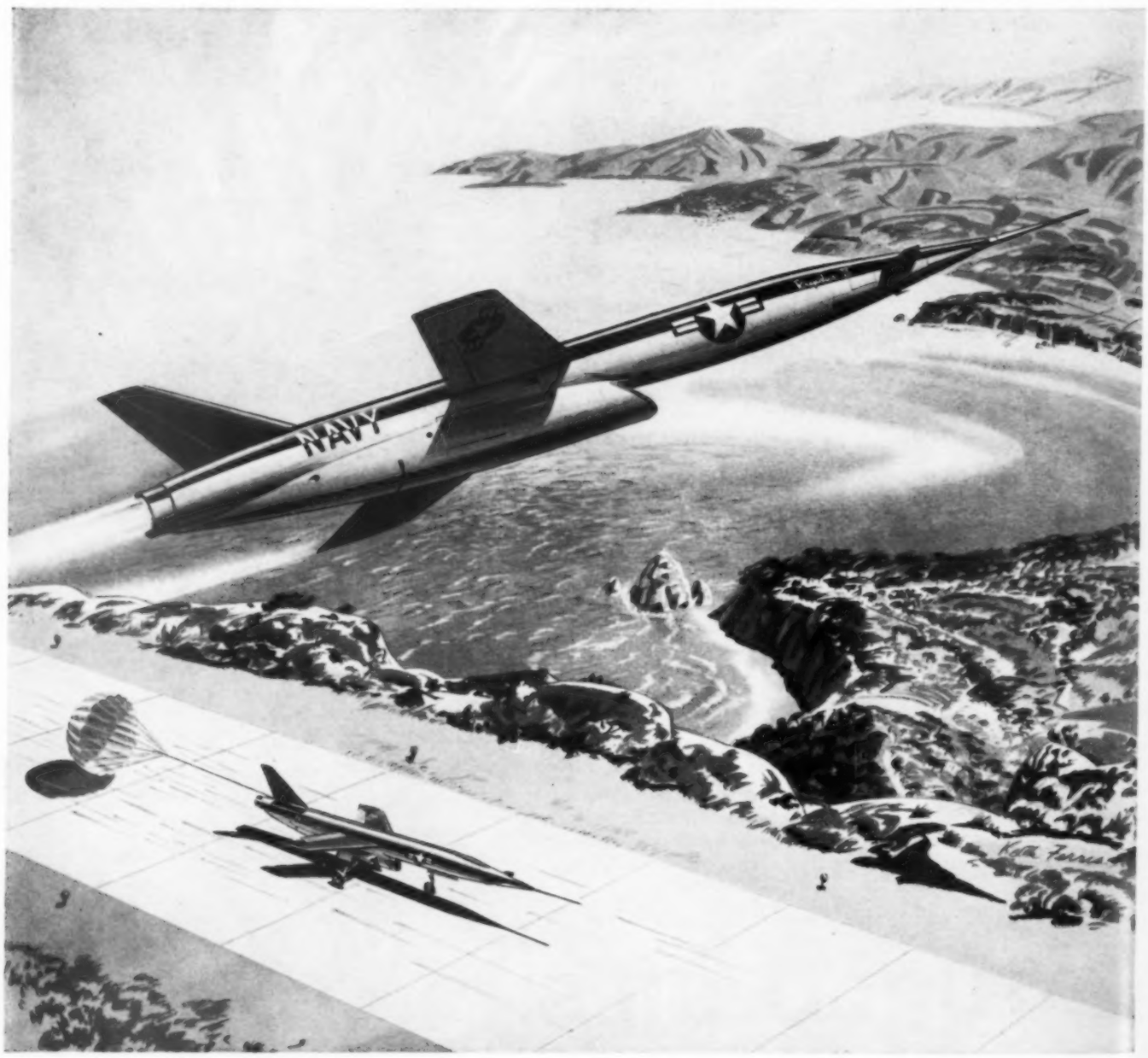
Most missiles land head-first – and, like a bomb, just once. This destruction is desired in a missile strike, but it makes development costly. Scores of missiles often are expended before development problems are solved.

Vought's *Regulus I* and *II* reduce this expense by their dual application. Tactical versions of these guided missiles can strike head-on, with a devastating nuclear wallop. Test and training versions, used in development, can be recovered to fly again.

One *Regulus* was flown and recovered *18 times*... another made 16 successful flights. Six hundred recoveries of both missiles have saved $102,950,000 and gained an inestimable quantity of technical data.

Regulus I has armed submarines, cruisers and carriers with a nuclear punch since 1955. *Regulus II*, with a range of more than 1,000 miles and able to exceed twice the speed of sound, will join the Navy's underwater and surface Nuclear Fleet.

CHANCE VOUGHT AIRCRAFT
INCORPORATED · DALLAS, TEXAS



CHOOSE NOW FROM

5 GREAT

AERO Commanders

with the addition of its new models 500 and 680E, Aero Commander now offers the world's most versatile fleet of light twin executive aircraft!

THE NEW 500 provides famous Aero Commander high-wing performance and stability in a full-sized, utility airplane at a NEW, LOW COST! Here is multi-seat capacity—2,150 lbs. of useful load—in a 6,000-lb. aircraft which cruises at 205 mph, flies 1,100 miles without refueling, takes off and lands in less than 1,400 feet!

The 500 flies at 24,000 feet—climbs 1,400 fpm! On only one engine, it will climb at 310 fpm and fly safely at 8,000 feet! Complete dependability!

And the Aero Commander 500, at only $62,500, delivers *more payload pounds per dollar* than either of its two nearest competitors!

THE 680E introduces a new, high standard of useful load capacity for its weight class, too—3,025 lbs. of payload in a 7,500-lb. aircraft! Cruising at a comfortable 226 mph, the 680E is truly an all-weather airplane! It will fly at 25,360 feet, has a range of 1,400 miles!

THE NOW FAMOUS 680 SUPER is the superbly-performing Commander which has become the favorite of hundreds of pilots and others who know aircraft best.

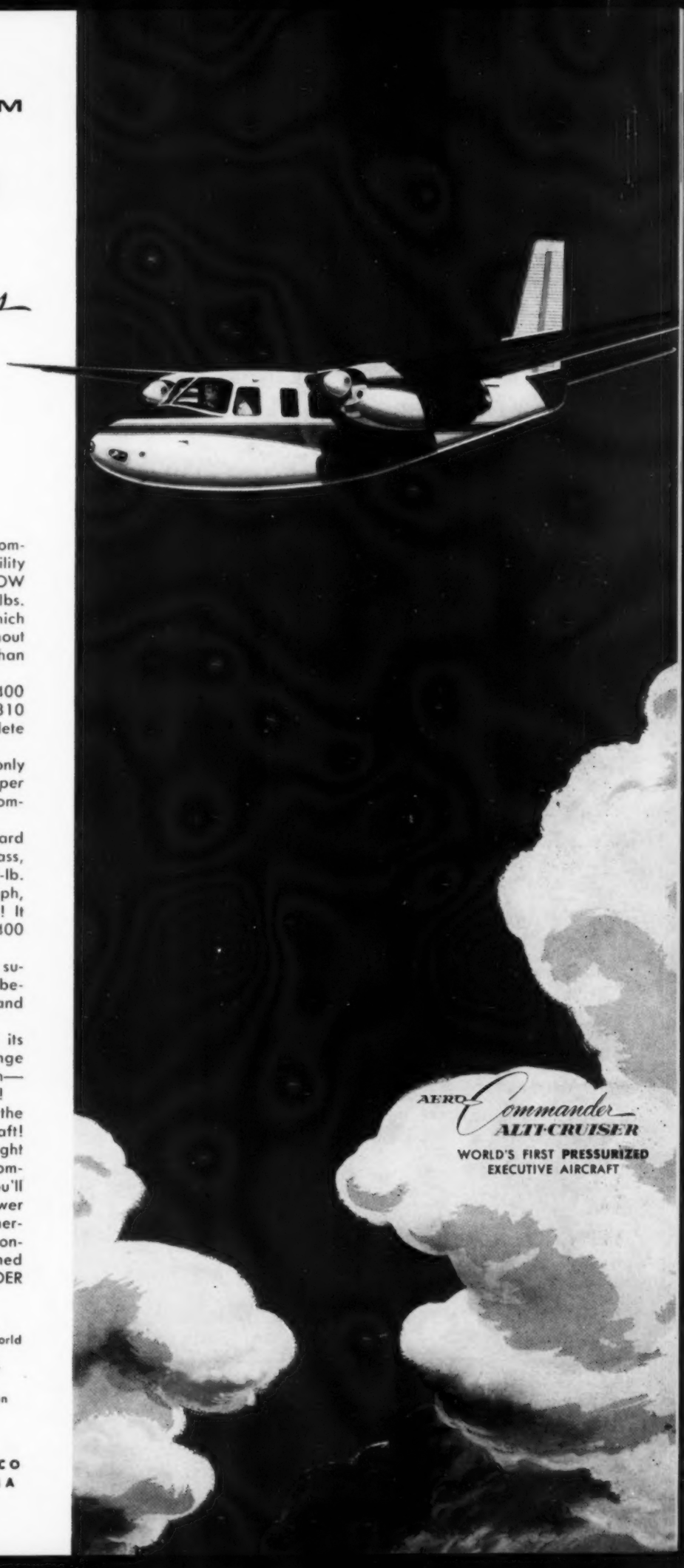
THE LONG-STEPPING 560E has earned its position as the leader for its speed and range abilities. It cruises effortlessly at 210 mph—spans over 1,600 miles with fuel to spare!

AND THE LUXURIOUS ALTI-CRUISER is the world's FIRST PRESSURIZED light twin aircraft! Comforts include on-the-ground and in-flight air-conditioning and a private lavatory compartment! High above the weather, you'll enjoy cabin pressure thousands of feet lower . . . you'll enjoy the security of weather-avoidance radar! The industry's finest conception of marvelous performance combined with elegance is the AERO COMMANDER ALTI-CRUISER!

LOOK TO (C)'s THE LEADER
Commander

NOW, FOR AS LITTLE AS $62,500 you can enjoy world famous Aero Commander performance! Your card or letter will bring you an ILLUSTRATED BROCHURE on any of the five models. WRITE TODAY!

AERO DESIGN & ENGINEERING CO
BOX 118, BETHANY, OKLAHOMA



He Found Success in the Air

At California's Ontario International Airport, 35 miles from downtown Los Angeles, Shell dealer Les Farrar runs one of the fastest growing aviation service companies in America

As Les will tell you, to run a successful aviation service you must have top-flight products and equipment.

In his own words, "I was looking for an Oil Company that guaranteed quality products—quality service—down-the-line dependability. And I wanted the best dealer-supplier relationship available. I found Shell's approach similar to mine—a 24-hour readiness to go beyond the letter of a contract to be helpful."

So Les Farrar teamed up with Shell 5 years ago.

Today Ontario International Airport provides rapid, efficient fueling service for commercial, military, business and private aircraft . . . in fact just about anything that flies. Growth has been rapid . . . gallonage has increased *twenty* times in the five years Les has been with Shell.

How does he do it? Les picks up valuable merchandising tips from the Shell dealer magazine. And through the Shell Aviation Specialist, Les keeps posted on new ways to build the kind of service fliers want.

A key part of his service program is the Shell Credit Card System . . . a time-saver designed to help fliers meet exacting schedules.

Business is good at Ontario. In fact it is so good that Les is looking forward to expanding his facilities. Plans include a new 2,000-foot runway extension to accommodate the ever-increasing traffic.

The fine reputation of the Les Farrar Aviation Service is widespread and still growing. As for the future? Les himself will tell you that with Shell helping him in every venture—the sky's the limit!

Round-the-clock tower and modern all-weather equipment serve the airlines, a Forestry Service fire-fighting unit, an Air National Guard unit and turn-around customers.

Studying airport expansion plans (left to right) are Art Clark, vice-president of Les Farrar Aviation Services; Thomas E. Flaherty, Airport Manager; Fred Stewart, Shell Aviation Representative; and Les Farrar.

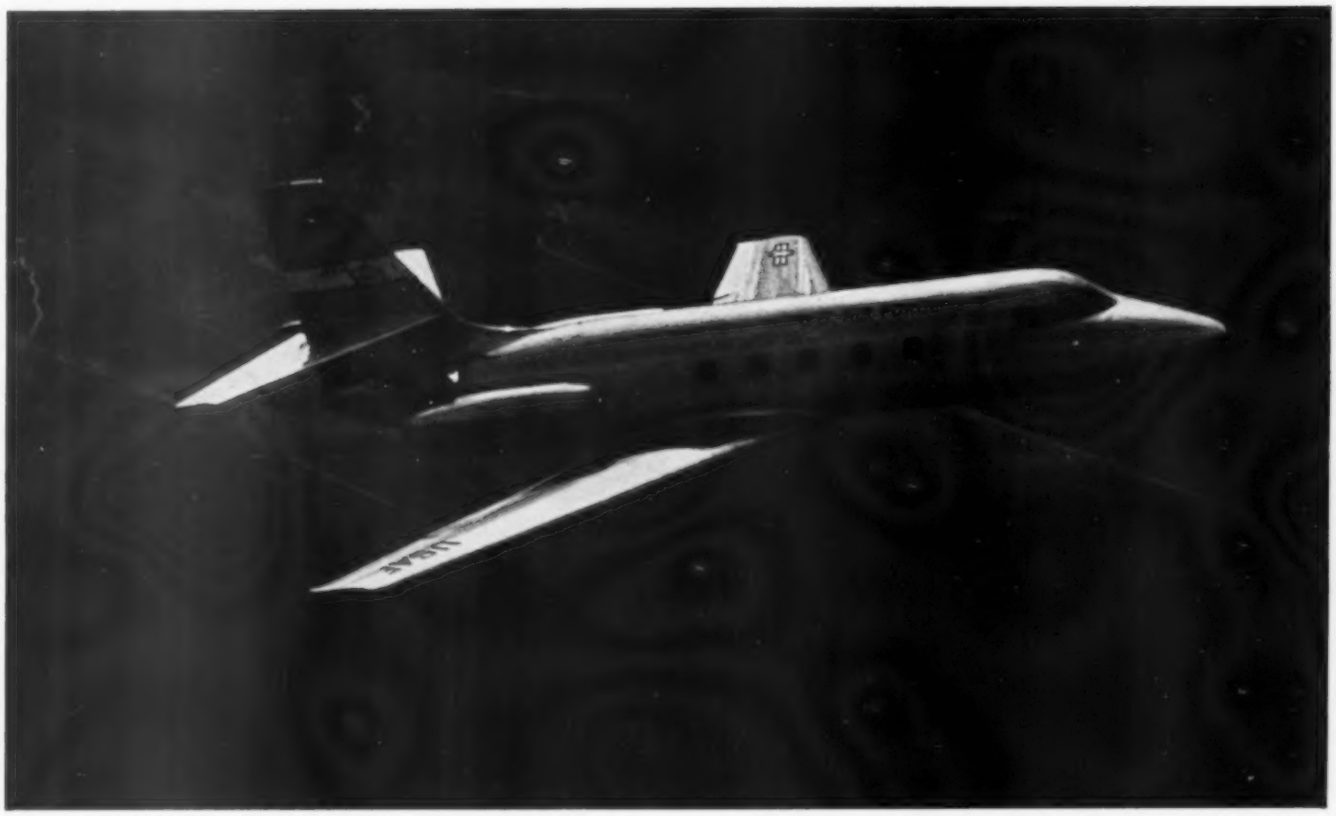
Giant military transports come to Ontario for modification by Southern California Aircraft Corporation and Lockheed Aircraft Service Corporation. They rely on Les Farrar for fine service and Shell for high-quality fuels and lubricants.

It pays to be a Shell Aviation Dealer

—and your nearest Shell Office will be glad to tell you why

SHELL

How to do 6 days work in a 5-day week



Top decision-makers in the U.S. Armed Forces and their civilian counterparts have a common complaint: there aren't enough hours in any day to accomplish all the things they'd like to do; nor enough days in any week to go all the places they should go.

That's why Lockheed built the JETSTAR—a 10-passenger "economy size" jet transport that can match the performance of the big jets at only a fraction of their costs.

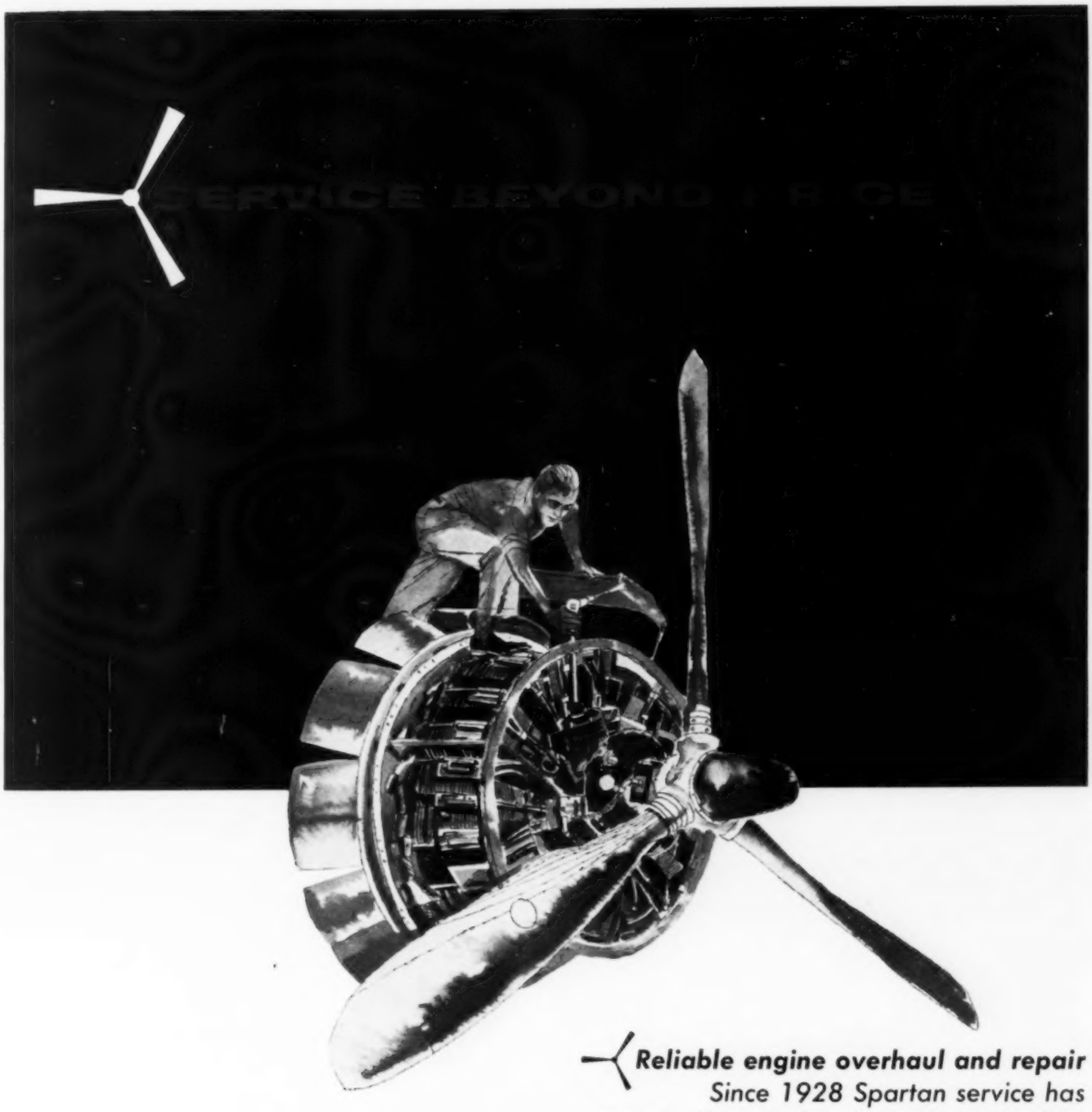
In the JETSTAR you can go any place in the world in the shortest possible time, in fully pressurized and air-conditioned comfort. The JETSTAR cruises at 500 knots, above the weather at altitudes up to 45,000 feet. What's more, it's so amazingly quiet (due to aft fuselage mounting of engine jet pods) that in-flight group discussions can be held in normal conversational tones. There are facilities for desk work and dictation, sleeping accommodations for overnight flights, toilet and galley. Even after transcontinental non-stop flights, the JETSTAR delivers its passengers to their destination feeling fit and ready for work.

By taking you *where* you want to go, *when* you want to go, at jet speeds—and enabling you to work enroute—the JETSTAR can literally help you do 6 days work in a 5-day week.

The only aircraft of its kind flying today, the JETSTAR has built-in stamina that assures optimum utilization at the lowest dollar cost—a distinguishing characteristic of Lockheed military as well as civilian planes for a quarter century.

Lockheed Aircraft Corporation, GEORGIA DIVISION, *Marietta, Georgia*

LOCKHEED *means leadership*



Reliable engine overhaul and repair

Since 1928 Spartan service has contained a priceless ingredient—quality! The high standards set by Spartan's skilled specialists has meant

greater safety •
better performance •
lower operating costs •
right price for quality work •

Spartan's shop facilities can put your aircraft in first class condition and keep it that way—write, wire or call Spartan today!

SPARTAN AIRCRAFT COMPANY

AVIATION SERVICE DIVISION • MUNICIPAL AIRPORT • TULSA, OKLAHOMA

Flying Cattleman Likes SAC Cessna Service

W. R. (Bob) GODDARD ENDORSES FLAT RATE SYSTEM FOR "310"

W. R. (Bob) Goddard knows the best in ranches, oil wells, and airplane service, having invested successfully in each. He pilots a Cessna 310 to cover interests throughout the southwest, a favorite destination being his great cattle spread in the "Hereford Heaven" section of south central Oklahoma.

Booted Bob is pictured in discussion with Earl Webb, Southwest Airmotive service sales manager. The topic is SAC's new Flat Rate Catalog, a page of which lists overhaul prices for the Cessna 310 — airframe, engine, accessories, propellers, and instruments. Bob Goddard not only knows the best in Cessna service, he consistently gets the best at Southwest Airmotive and endorses SAC's flat rate way of doing things.

By the way, that table in the middle of the ramp isn't so far-fetched. It symbolizes the fact that wherever you are, and whatever the size or type of your airplane — large or small — Southwest Airmotive will make it convenient and economical for you to enjoy the finest One Stop Service in all America.

Southwest Airmotive Co.

LOVE FIELD, DALLAS

DISTRIBUTION DIVISIONS: KANSAS CITY • DENVER

1932 A QUARTER CENTURY OF LEADERSHIP 1958

Just among ourselves

Promised STC Relief

FOR the past year, readers of this publication have followed the fight by repair and modification shops with the Civil Aeronautics Administration over the way supplemental type certificates were being handled by the CAA.

Last month at the Reading Aviation Service annual operations and maintenance conference, a spokesman for the CAA outlined a new policy and new procedures aimed at simplifying and speeding the issuance of STC approvals following aircraft modifications. While it remains to be seen whether the new approach will provide the necessary relief to an important segment of commercial aviation, it certainly is reassuring to see our democratic processes at work and to know that our Federal aviation agency will back down when facts and conditions justify a policy reversal.

Two factors stand out in sharp focus as a result of the supplemental type certificate complaint. First, the people affected got together, discussed their problems, assembled the facts, journeyed to Washington and presented their case to the CAA. Second, James T. Pyle, Administrator of Civil Aeronautics, proved beyond any shadow of a doubt that he is a capable and dedicated administrator by providing a sympathetic ear, directing his staff to look into the problem objectively and seek a practical solution. When Pyle learned that the industry's bill of particulars was indeed factual after sending a CAA survey team into every region, he took immediate action which will be backed up by a longer-range program involving regulatory and other policy changes.

The immediate procedures are:

1. Increase emphasis on the proper appointment, training, supervision, and numbers of Designated Engineering Representatives in the STC program.

2. Permit the DER to approve the data and obtain STC without initial review by CAA; post-review will be made. This will permit the local inspector to release aircraft after his conformity inspection.

3. Authorize direct communication of technical information by the CAA Engineering Service Representatives and field CAA Aircraft Maintenance Inspectors, to eliminate where possible the time-consuming exchange of this information by mail.

4. Increase responsibility of DER's to conduct compliance inspections, permitting obtaining of STC number by telephone from CAA regional headquarters.

5. Assign more engineers to STC duties when found necessary to meet required regional workload of Engineering Service Representatives.

6. Reiterate the definition of repair as the "process of returning an aircraft to its original airworthiness specifications and standards," making clear that none of this work would require an STC approval.

7. Establishes the CAA Aircraft Maintenance Inspector as the primary representative in the field who will determine when an aircraft can be returned to service without engineering approval.

The CAA has also recommended to the Civil Aeronautics Board basic regulatory changes in the civil air regulations and pointed out inconsistencies existing in and between CAR 1 and CAM 18. The amendment will provide that an operator or person altering the aircraft will be allowed to determine that the altered aircraft meets the applicable airworthiness requirements and is in condition for safe operation. Proper records must be kept and notification given the CAA so that the CAA can maintain compliance through a systematic surveillance program. It will be up to the owner or the shop to apply for a supplemental type certificate. Under the proposed amendment the owner or shop will have the responsibility not to alter or operate the aircraft unless it does comply with the applicable airworthiness requirements.

A lot of trouble came about in the interpretation of what constituted a major change and what constituted a minor change. To assist the industry the CAA is now sending district offices guide lines pertaining to various modifications such as radio installations, oxygen systems, antennas, and other systems so that inpectors can advise applicants concerning such modifications which then should not require the issuance of an STC.

We sincerely believe that these changes in policy within the CAA will not only give the industry the relief sought but also maintain intelligent safety standards which all conscientious people in aviation desire to preserve. The willingness of the CAA administrator and his staff to sit down and work out this problem is a good thing and should produce mutual respect and confidence between the industry and CAA. All of us might consider this case as a return to the healthy partnership type of relations that have, from time to time, under capable and inspired leadership, contributed so much to aeronautical progress in the United States.

Private Pilot Requirements

THE recent changes in Civil Air Regulations proposed by the Civil Aeronautics Board (58-2) upgrading both private and commercial pilot certificate requirements has brought about a flood of response from every phase of general aviation. After considerable study the General Aviation Facilities Planning Group believes the matter can be resolved by creating two types of private pilot certificates.

The first would be a "primary" certificate in which the five hours of instrument training proposed in 58-2 would not be required. The primary private pilot would not have to learn radio navigation, would be limited to cross-country trips under 50 miles except when endorsed in his log book by his instructor for trips beyond 50 miles, and have 25 dual and solo hours minimum. He would not fly in control zones.

The advanced private pilot certificate holder would be required to have the five hours of instrument instruc-

tion as called for in 58-2. GAFPG also feels that additional dual instruction be given in night flying with a minimum of five take-offs and five landings at night. The advanced private pilot would be trained to fly in control zones and in radio navigation. The five hours of instrument training would be for the purpose of inculcating more respect for weather — not teach him to fly instruments. Actually it should teach him he can't fly instruments without a full instrument course. GAFPG disagrees with 58-2 that the advanced rating should require ten additional hours of total time before certification. There would be no restrictions on this class as is the case of the suggested primary private ticket. The changes proposed for commercial pilot certification were endorsed by GAFPG.

It was the consensus that the CAB should sit down with the industry and completely re-write Part 20 of the Civil Air Regulations and modernize all the syllabus material for all categories of pilots in line with the new pilot requirements, if adopted. The Group volunteered its services in the prepartion of new handbooks and texts to serve all categories of pilot instruction.

We are firmly convinced this line of thinking should prevail in the plan to beef up flight instruction and produce better pilots without killing the goose that lays the golden eggs. The step-by-step system from student to primary to advanced to commercial certainly seems simple, logical and practical. Under this plan, the five-hour instrument training requirement for the private certificate is palatable and should be given a try.

A Civil Aeronautics Act of 1958

HEARINGS during the month of June on the Monroney Bill (S-3880) before the Senate Interstate and Foreign Commerce Committee made history; never before has there been such unanimity on a piece of basic aviation legislation. Even the government departments whose power would be completely removed or reduced went on record for a single, independent federal aviation agency.

There are, of course, several areas of disagreement on particular provisions of the proposed legislation. Considerable discussion has taken place as to the extent of military participation and power. Nearly everyone agrees the military should have a clear-cut position in the new agency but the final power would always be civilian, even in case of war. On the matter of appeal the original bill provides for appeal to the Civil Aeronautics Board from orders of the Administrator in certain instances but it now appears that the appeal provision will be restricted to a few definite fields of action, completely spelled out, or removed altogether. Another point where considerable difference of opinion has been manifested is in the method of accident investigation. By the time the House Committee is through with its hearings these points probably will be ironed out.

Spokesmen for general aviation, for the air transport industry and for the government agencies were in broad general agreement in support of the legislation. Only a few spokesmen for the military seemed to be out of step with the majority opinions expressed at the Senate hearings. Chances for passage at this session of Congress — seven months ahead of the original target date set by the Administration — appear to be excellent. Senator Monroney deserves a vote of thanks.

Pilot Factor vs Pilot Error

WHEN a pilot causes an aircraft accident by doing something wrong, although he is capable of doing it right, his accident is clearly the result of pilot error. It wouldn't have happened if the pilot hadn't goofed.

But there are recognized circumstances in aircraft accidents when a skilled pilot finds himself in a situation literally beyond his capabilities. It is all too easy for accident investigators to dismiss such an accident as having been caused by "pilot error" when no mistake, no negligence and no act or failure to act on the pilot's part are involved. Far too many such pilots have been wrongly victimized, persecuted and prosecuted.

An end to such unfairness has been ordered by the Navy. Effective July 1, its accident boards have eliminated the term "pilot error," burying it completely. In its place will be the term "pilot factor." The two phrases have vastly different meanings. "Pilot factor" recognizes that there can be many contributing elements in an accident. The fact that the pilot is there makes him a factor in most accidents, but is he "a" factor among several or is he "the" primary factor? That's the Navy's challenge to fair investigators.

The major purpose of aircraft accident investigations is to promote better air safety. Being painstakingly fair to the pilot can contribute to improved safety. This will result when

(Continued on page 40)

Flight Magazine Salutes:

★ ★ ★ **JAMES T. PYLE,** Administrator of Civil Aeronautics, and his engineering staff, for keeping faith with the industry in revising the Supplemental Type Certificate policies which have worked a serious hardship on many modification and aero repair stations. (See editorial on page 17.)

★ ★ ★ **THE ORD (NEBRASKA) "QUIZ" AND EDITOR ED APKING,** for sponsoring an annual soil conservation tour in the newspaper's trade area, which last year doubled inquiries on soil conservation according to local SCS officials. During the year between the first farm inspection tour by local airplane owners and the CAP, the number of airplanes at the Ord airport rose from three to eleven.

★ ★ ★ **COLLINS RADIO COMPANY AND ADDISON AIRPORT (DALLAS)** for installing a TVOR terminal omni station at the nation's newest private enterprise airport. Addison owners have invested $3,000,000 in this private airport facility nine miles north of Love Field. With lights, terminal omni and Unicom the field now boasts day and night and all-weather operations.

★ ★ ★ **PIPER AIRCRAFT CORPORATION** for spearheading a drive to get more business executives to learn to fly while taking their summer vacations. Operators offering flight instructions near recreational areas can cash in on the idea — it's not copyrighted!

★ ★ ★ **USAF MAJOR GENERAL T. P. GERRITY,** Commander, Oklahoma City Air Materiel Area, for helping to sponsor a one day Space Age Conference at Oklahoma City in May which attracted 6,000 youngsters of high school age. Educational television carried the program to an additional audience of 250,000 and 70,000 persons viewed the space age displays held in conjunction with the conference.

Test your cross-country memory

Can you name this airport?

Clue: *The New England city it serves is the home of a famous Ivy League university.*

Now test your aviation-oil memory: Do you remember these important reasons why Gulf oils are better for your engine?

1. In addition to providing efficient, thorough lubrication, Gulf Aviation oils help keep engines *clean—and safe!*

2. Gulf-clean engines can go longer between overhauls, because there's less wear and tear on engine parts.

Choose either Gulfpride Aviation Oil Series D, the detergent oil, or Gulf Aircraft Engine Oil, the straight mineral oil. Both keep your engines Gulf-clean and safe.

The airport? You Yale men will recognize it as New Haven Municipal Airport, located four miles southeast of New Haven, Conn. It has two paved runways—the longest, 4,768 ft.

Here you'll find Gulf Aviation products and friendly, efficient service under supervision of Jack Usher, president, Usher Aviation, Inc.

GULF

AVIATION PRODUCTS

Fly safely with a Gulf-clean engine

marching forward with...

AVIATION

Grumman Gulfstream

The aviation industry and RCA have long been partners in progress. To this partnership, RCA has contributed a wide range of electronic aids that have played important roles in bringing aviation to its present high level of dependability, comfort and safety. A few that have found special application in civil aviation are named here.

RCA Air Traffic Control Transponder (AVQ-60) automatically and instantly enables the traffic control radar to locate and positively identify aircraft within its range. Light in weight and compact, it is designed for airline, business and military use.

RCA Weather Avoidance Radar (AVQ-50) brings the comfort and time-saving features of airborne weather radar to aircraft with power and weight limitations, such as Aero Commander, Twin Bonanza, Beechcraft Super-18.

RCA Storage Display Tube Indicator increases the effectiveness of the display by permitting the reading of the indicator in broad daylight without hood or shielding.

RCA Weather-Mapping Radar (AVQ-10), now used by many of the world's leading airlines, enables the pilot to "see" and evaluate the weather many miles ahead so that he may avoid areas of turbulence. This makes long and costly detours unnecessary, saves time and increases passenger comfort.

RCA Marker Beacon AVR-200 meets the demand for lightness, transistorized design, low power requirement and minimum maintenance. Functions on DC or AC primary, and actually needs less power than any of the three lamps it operates.

Ask for full information with regard to any or all of these items.

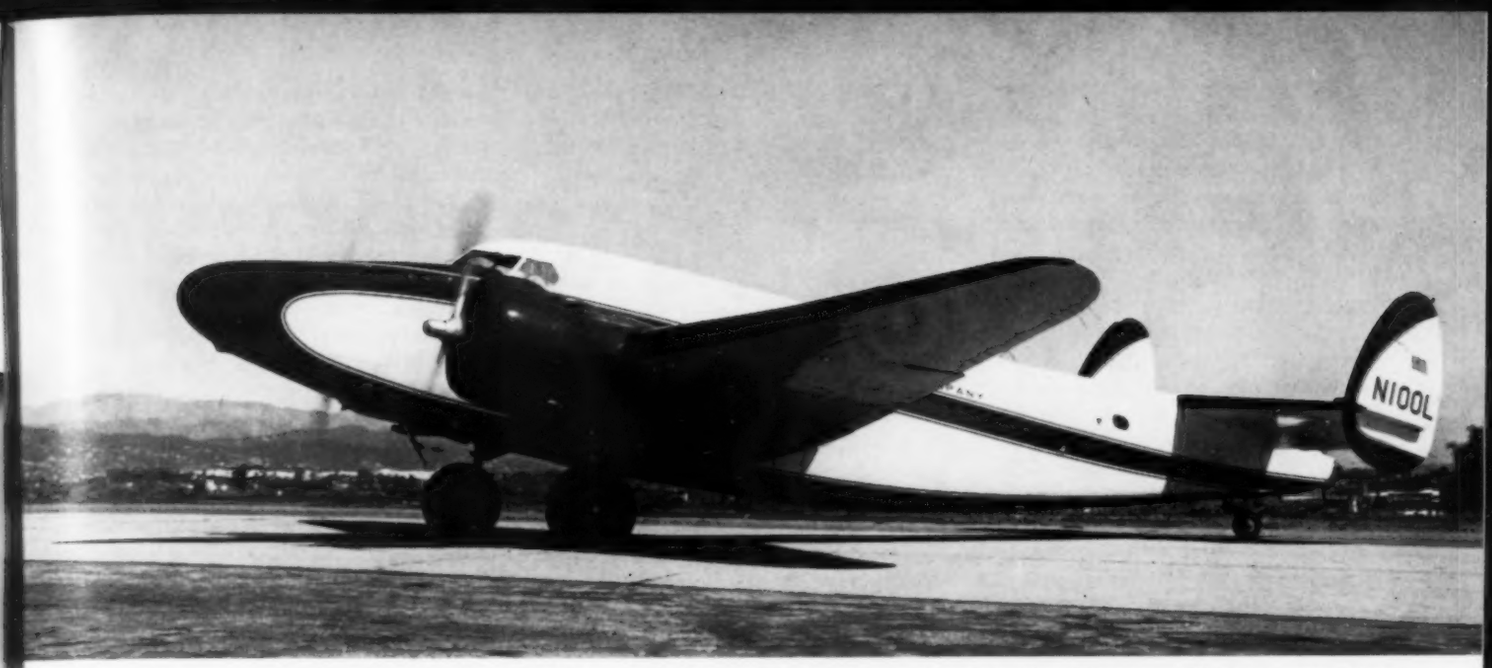
RCA

Tmk(s) ®

RADIO CORPORATION of AMERICA

CUSTOM AVIATION EQUIPMENT

11819 W. OLYMPIC BLVD. LOS ANGELES, CAL.



One of many corporate Learstars in worldwide use is this one belonging to the Solo Cup Company, Chicago. The 10-14-*place Learstar has outstanding speed-load-range flexibility at weights of* 24,000-*lb gross and* 15,300-*lb. empty and with* 1,324-*gal. fuel capacity. For example, its Wright* 1,425-*hp. engines consume* 108 *gph. for* 275-*mph. cruise speed using* 55% *power at* 10,000 *ft.* —(PacAero Photo.)

The Learstar Story

PacAero's aircraft improvements are exemplified by the successful Learstar program

By GEORGE E. HADDAWAY

ONE of the busiest corners of the world's busiest general aviation airport is occupied by PacAero Engineering Corporation, whose sole purpose in life is quite obviously to make good airplanes better.

This beehive of activity on Santa Monica's Clover Field made its reputation on the now famous Learstar conversions of the war-tested Lodestar and while the Learstar is still the major item out in the shop there's no telling what will get top billing a few months hence. Over on one corner of the ramp you'll find the Napier Eland turbo-prop conversion of the Convair nearing CAA approved type certification, while at the other end you'll find a staff of mechanics and engineers sweating out modifications of a twin Beech, a Constellation or a T-28. It's as diversified a mod center as you'll see anywhere. PacAero's list of customers reads like a Who's Who of American industry.

We have heard owners of Learstars refer to them as the finest and safest modern executive airplanes in the air today. Few aircraft can boast the enthusiastic owner loyalty of this finely engineered equipment which had its beginning back in 1953 when Bill Lear purchased a Lodestar for the electronic firm bearing his name. Known as the "Green Weenie" old 91 Fox became an experimental job when Lear figured he could improve the craft both performance and safety wise. He inveigled the great Gordon Israel to leave his engineering post at Grumman and set up shop in the Lear hangar at Santa Monica. In May of 1954 the first Learstar was successfully test flown. Performance was better than the original engineering called for.

Our enthusiasm for the Learstar began a couple of years ago on a cross-country flight of over 1,000 miles with Al Brill in Chance Vought's airplane— the first Learstar "production" model. Shortly after Gordon Israel received the supplemental type certificate from the CAA, under the very tough requirements of Part 4b (transport category) of the Civil Air Regulations, Chance Vought paced the Learstar with an instrumented Cutlass. Their data reduction on speed proved the claimed performance and Chance Vought engineers ran a complete Schneider on Gordy's engineering, the beefed up structures and all the changes therein. "We now believe your claims," said the CV people, " and want to buy the airplane." Learstar was in business.

This is what is called a "prestige" sale and a most important ingredient in selling any airplane. Since that first sale practically every ship has had a prestige sticker on it; for deliveries included such blue chips as British American Oil, U.S. Steel (2 airplanes), Burroughs, Krupp of Germany, Waterman Steamship, Dayton Newspapers, Avco, American Cyanamid (2), Sinclair Oil, Upjohn, Gillette Safety Razor, Square D, Plymouth Oil, Warren Petroleum, Minnesota Mining and Manufacturing, Sangamo Electric (2), Texas Eastern Transmission and Westinghouse.

Performance

Last month we had the privilege of a trip in the latest PacAero Learstar— a round trip from Santa Monica to San Francisco. We climbed out of Clover Field indicating 150 knots, leveled off at 11,000 feet and indicated 198 knots pulling 30 inches at 2050 rpm. or 55 per cent power. This trued out 244 knots (280 rpm.) at plus 12 degrees centigrade. We made the 293 nautical miles (336 statute miles) with a helping tail wind in one hour, seven minutes which we figure to be 323 statute miles per hour. We burned 103 gallons of gas.

We talked Hal Herman, PacAero

pilot, into giving us a short field take-off. This he did and there have only been a few to compare with it during our long years around airplanes. We were off the ground from a standing start in nothing flat, using about one-fourth of the runway. The accelerated climb-out was 3,000 feet per minute at what seemed to us better than 45 degrees of climb.

This Learstar revealed many improvements from the original Chance Vought airplane, although it has gone back through the line once for additional improvements. Both the cockpit and the cabin are amazingly quiet and the cockpit visibility is something to rave about, especially now with everybody a bit jumpy on the see-and-be-seen basis. Our cabin had a 3-seat couch, 6 regular airline type cabin seats, a jump seat in the cockpit in addition to the pilot and co-pilot seats, a commodious toilet, refreshment bar and coat closet. The large picture windows in the roomy main cabin provide a fabulous view for the passengers.

Now to the technical changes Gordon Israel and his staff turned out to create this modern luxury executive transport. In the first place, says Gordon, he started with a "damn good airplane"—the Lockheed Lodestar. "Our job could not have been possible without the help of the Lockheed factory not only by making all their drawings available but in guidance and assistance as we went along," Israel admits. They decided from the outset to go for certification under 4b of CAR, the toughest requirements in U. S. civil aviation. Certification was received in January, 1955.

How It's Done

Actually the Learstar conversion is a complete re-manufacturing job. Construction of a Mark I Learstar, which has a gross take-off weight of 24,000 pounds and a landing weight of 21,500 pounds, begins with a complete dismantling operation. All flight controls, the engines and accessories, hydraulic and electrical systems are removed. The airplane is completely stripped naked, including paint, down to the bare structure. A complete inspection is made and if there is any evidence of corrosion the parts in question are replaced with new material.

From this point on the Learstar is built up and assembled into a machine that for all practical purposes might have rolled off a new production line.

The wing outer panels were completely re-designed from the 30 per cent chord line to the leading edge. This re-design incorporates modified leading-edge contours making possible the elimination of the fixed leading-edge slots. It makes for a great improvement in lateral control at the stall, especially during icing conditions and reduces the drag of the wing at cruising speeds. The new leading edge incorporates integral fuel tanks with a capacity of 470 gallons as standard. Extra-long-range tanks of 696 gallons capacity are optional. Fuel dumping is provided for these tanks in order to reduce landing weight in case of an aborted flight.

The wing center section has structural reinforcements for the increased gross weights. Flap travel has been reduced to 55 per cent of the original travel, permitting elimination of the bat wings and removal of the long flap tracks that extended beyond the trailing edge. The center section fuel tanks are completely cleaned, inspected and resealed.

Goodrich high-pressure de-icing boots are installed on the leading edge, actuated by automatic cycling valves located immediately adjacent to each boot section. The valves supply alternately high pressure during the inflation cycle and suction during the deflation cycle, resulting in much faster action of the boots. When inoperative, suction is applied at all times so the boots will lie flat against the wing and preclude aerodynamic disturbance.

Quite a few changes on the empennage assembly provide stability and control in accordance with transport category 4b requirements. Rudder spring tabs, now a must on all Lodestars, reduce the minimum single-engine control speed with moderate pedal forces to a value well below V-1 speed. The detail design of these spring tabs is such that they will withstand an infinite number of complete reversals at maximum deflection without approaching the fatigue limit of the spring or any other elements of the system. The tabs are dynamically balanced and the rudder mass balance has been increased to prevent any possibility of flutter in the event any bolts or connections are overlooked during the overhaul.

During official demonstrations the airplane was actually dived to V/NE with the spring tab completely disconnected from its operating mechanism. Rudder kick springs are installed in the outer stabilizer tips to prevent rudder aerodynamic lock at high yaw angles.

The stabilizer angle has been increased to allow elevators to trail neutral at the higher cruising speeds. Elevator spring tabs provide lower control forces thereby eliminating the large change in trim that existed with changes in power and flap settings. These spring tabs permit inadvertently taking off with full nose-up trim without encountering excessive control force while the airplane is being properly trimmed. The tabs were designed after a series of maneuvering flight tests so that it requires 60 pounds per g to maneuver the airplane. This feature prevents overloading the structure at high indicated air speeds which could result from either an intentional high-speed letdown or an inadvertent build-up in air speed during foul weather. High-presure boots are also installed on the leading edges of the horizontal and vertical tail sections.

Pilot's Cockpit

The fuselage boasts a new curved windshield with overhead panel for better visibility in turns. The front spar at the aft end of the cockpit has been lowered to make it flush with the cockpit floor. The cockpit reveals considerable time and thought on complete re-design. A completely-

LEARSTAR MARK I

Factory Data

TYPE: 10-14-place executive transport converted from Lockheed Model 18-56 Lodestar, CAA-certificated in Transport Category, CAR Part 04b.

POWER PLANTS: Two Wright R-1820-76A engines, each rated at 1,425 hp. for take-off and 1,275 hp. maximum except take-off (METO) at 3,500 ft., 45.5 ins. manifold pressure and 2,500 rpm. Fuel consumption, 108 gals. per hr. at 10,000 ft., 55% hp. Fuel capacity, 1,324 gals. Oil consumption, 2 pints per hr. at 1,800 rpm. Oil capacity, 44 gals.

WEIGHTS: Empty (including standard radio and interior), app. 15,300 lbs. Gross weight, 24,000 lbs. Useful load, 8,700 lbs. Wing loading, 42.5 lbs. per sq. ft. Power loading, 8.4 lbs. per hp.

PERFORMANCE: High speed, 321 mph.; normal cruising speed, 275 mph. at 55% hp. at 10,000 ft. and 290 mph. at 60% hp. at 10,000 ft.; stall speed (landing with flaps), 89.2 mph. Climb at sea level and gross weight, 1,500 ft. per min. Service ceiling, 25,800 ft. Maximum range with 1,324 gals. of fuel, over 4,000 mi. Guranteed transport category performance.

DIMENSIONS: Length (including radar nose) 55 ft. 6 ins.; height, 11 ft. 10 ins.; span, 66 ft. 2 ins.; luggage compartments, 130 cu. ft. Wing area 551 sq. ft.

new pedestal features more logical and natural arrangements of the power plant controls and other equipment located thereon. The overhead switches and radio controls have all been eliminated and are re-located on consoles and on the instrument panel ahead of the pilot for easy access. Learstar pilots won't have to buy tri-focals to read the overhead dials and switches as they have been eliminated. If radar is desired, X or C band scopes can be located either in the instrument panel or in retractable flush housings on the floor. Picture windows are standard for the main cabin. A large saddle fairing enclosing ADF loops and antennas is installed between the fuselage and stabilizer. A longer tail cone for housing the retracted tail wheel is provided and a radar nose is standard.

The nacelles, including the firewall, are completetly new. Stainless steel skins aft of the exhaust stacks reduce fire hazard. The nacelles incorporate main landing gear wheel-well doors that are completely sealed on take-off to reduce drag and prevent ice and dirt accumulation in the nacelle. During gear retraction the clam shell doors open up and then re-seal after the gear is fully retracted. These doors are mechanically operated by the landing gear. The sealing of the wheel-wells and the finer aft lines of the nacelle have contributed measurably to the increased performance.

The main landing gear structure and retracting mechanism are substantially unchanged. However, new metering pins have been installed in the shock struts to reduce structural loads during hard landings. Goodyear 15.00x 16 tires and Goodyear single-disc brakes are employed. Complete dual brake systems from the brake pedals

Interior of Solo Cup Company's Learstar is well lighted by picture windows. Facing camera is Chief Pilot Lloyd Rondeau.
—(PacAero Photo.)

to shuttle valves mounted on the brakes at the wheels are installed. A nitrogen bottle is provided to extend the main landing gear in the event of failure of both the normal and emergency hydraulic systems. The tail wheel is completely retractable although the primary tail wheel structure has not been altered.

Both the electrical and hydraulic systems are completely new. Accessible junction boxes and wiring diagrams make trouble-shooting a simple matter during maintenance checks. An electrically-operated emergency hydraulic pump and an emergency hydraulic selector valve, located below the floor in easy access of both pilots, are provided. The valve can be used to select brakes, landing gear, flaps or particular system. The flush door above the valve is so designed that it cannot be closed unless the selector valve is on the brake system.

As for the fuel system there are just two 4-position (including off) selector valves mounted on the cockpit pedestal with no complicated cross-feed valves. The only possibility of fuel starvation is if the pilot selected an empty tank.

The basic flight control system is similiar to the standard Lodestar system. Electrically-operated, directional and longitudinal trim is provided on the left hand grip of each control wheel for operation by the pilot's thumb. A second switch for operation by the fore-finger is provided on a forward side of the control wheel so that an intentional desire to change trim is required. Obviously this system prevents inadvertent change of trim caused by the pilot accidentally hitting the thumb operated switch. A separate circuit breaker is readily available for de-energizing the systems in addition to manually operated trim controls capable of overpowering the electric controls. The elevator system incorporates an overcenter spring bungee that provides good longitudinal stability at cruise speeds and also reduces control forces on landing and flare out. A pre-positioning flap control handle is installed on the pedestal and can be set to the cruise, approach or landing position, the flaps automatically stopping at the pre-selected position.

Power Plant Refinements

The real payoff is in the power plant installation. Mark I has the Wright

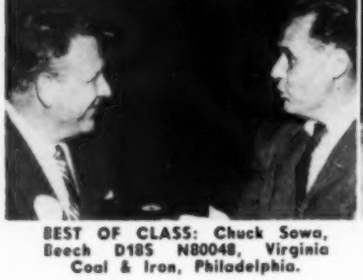
(Continued on page 62)

Proud as can be of the Learstar's excellence, here are Gordon Israel (left), the aircraft cleanup genius, and Vern Benfer (right), PacAero president.
—(PacAero Photo.)

Learstar instrument panel is model for efficient, modern layout. Note radio controls on eyebrow panel and around radar scope with comprehensive switch panel along bottom. Modern control pedestal does not hide instruments.
—(PacAero Photo.)

Twins Over 12,000 Lbs.

BEST INTERIOR: R. G. Reckner, Convair 440 N85U, U. S. Industries, Stratford, Conn.



BEST OF CLASS: Chuck Sowa, Beech D18S N8004B, Virginia Coal & Iron, Philadelphia.

Twins 5,00

BEST EQUIPMENT: Richard Co- gill, Aero Commander 68 N6841S, Stackpole Carbon, St. Marys, Pa.

BEST Aero ville

FLAGSHIP OF THE FLEET, BEST EQUIPMENT AND BEST EXTERIOR: Harold Curtis, Howard Super Venturas N100P and N200P, National Distillers, New York. Super Ventura N200P selected as Flagship of the Fleet for 1958

Twins Under 5,000 Lbs.

BEST OF CLASS: Ed Chatterton, Cessna 310 N310M, Sharon, Pa.

BEST EQUIPMENT AND BEST E TERIOR: Stanley Smith, Cessn 310B N3310, N. Y. Wire Cloth York, Pa.

EST IN Piper Wood

Reading Tops Again

READING Aviation Service did it again! For the ninth consecutive year the RAS meeting at Reading, Pennsylvania, out-did the previous meetings which are held primarily to spotlight the best of America's business aircraft. The Ninth Annual RAS awards meetings in June certainly cinched this colorful event's top-ranking position among the many conclaves, gatherings, conventions, reunions and get-togethers which use business aviation as the principal backdrop. Some of the Reading visitors are

Antique Aircraft

BEST EXTERIOR: Fred Johnson, Aero Commander 520, Summitville Tiles, Summitville, Ohio.

BEST INTERIOR: William Gunn, Beech D18 N44624, Braund Plywood, Birmingham, Mich.

BEST RESTORED ANTIQUE: John Stirling, 1932 Waco UEC N12472, Arlington, Va.

OLDEST ANTIQUE: Robert Hoover, 1928 Waco 10 N5852, Harrisburg, Pa.

Single-Engine Aircraft

EST INTERIOR: Bert Whitcomb, Piper Apache N3286P, Oval Wood Dish, Hartford, Conn.

BEST OF CLASS AND BEST EQUIPMENT: Ed Chatterton, Cessna 182 N182M, Sharon, Pa.

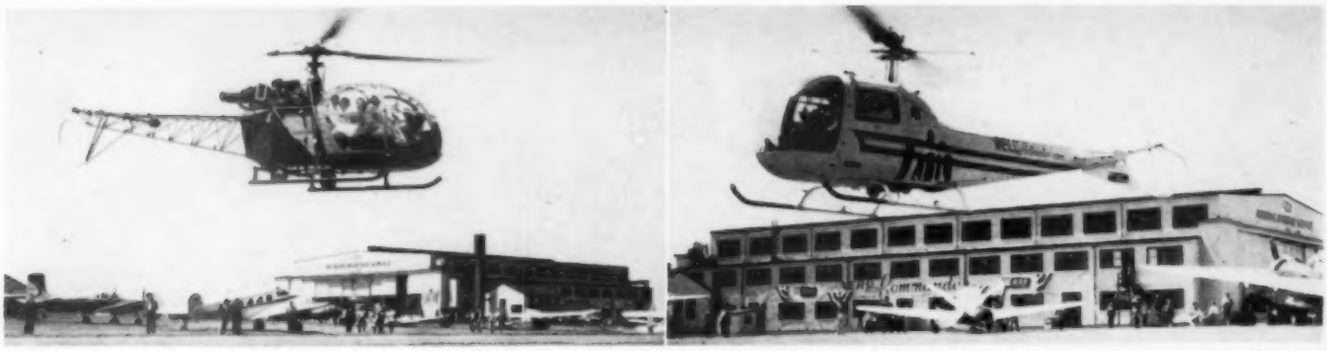
BEST EXTERIOR: J. J. Ryan, Beech G17 N34R, Greensboro, N. C.

BEST INTERIOR: Laren Pitcairn, Helioplane N4135D, Philadelphia.

pictured below and Sime Bertolet is pictured above presenting awards to pilots of outstanding aircraft.

Blessed with magnificent CAVU weather, this year's meeting attracted as fine a display of flying equipment ever assembled and offered a jamb-up static trade show of aviation products and accessories by some forty leading aviation manufacturers, suppliers and service institutions. For the frosting on the cake, all in attendance were treated to a battery of informed and competent speakers on a variety of timely subjects concerning operations and maintenance in the field of general aviation.

The Civil Aeronautics Administration used this year's meet to release to the industry a significant change in procedures covering supplemental type



Helicopters joined in the business aircraft activities at Reading as evidence of the copter's new-found prominence in corporate flying. Republic Aviation sent its turbine-powered Alouette (left) and Bell Aircraft its popular Model 47J Ranger. Sailplanes can be seen on the ramp beneath the Alouette.

—(Reading Aviation Service Photos.)

certificates, promising long-sought relief from restrictive measures and interpretations during the past year. The news was outlined by CAA Chief Engineer Henry Weeks. (See this month's editorials, pages 19-20.)

Narco's Gil Quinby gave an up-to-the-minute, objective and altogether enlightening run-down on CAB Draft Release 58-5, which would require TSO'd approved radio equipment for all IFR operations with installations and major repairs to be done by CAA approved radio shops.

Problems of single-engine IFR flying were discussed by a panel of experts composed of Air Facts' Leighton Collins, Red McFarlane, Don Patrick, and Professor L. Z. Seltzer. Howard (Pug) Piper of Piper Aircraft brought us up to date on what's being done to solve the icing problem in general aviation operations. New techniques now being experimented with point to the possibility that in the very near future the icing bugaboo will be whipped for the lightplane pilot without too much sacrifice in weight or too heavy a burden from a cost standpoint. In fact, Central Aero Supply displayed a brand-new system soon to be marketed for light twins by the B. F. Goodrich Company.

Gene Charles of Aero Design made a graphic presentation of the new Alti-Cruiser and Lee Smith of Bell Helicopters dispelled the myths surrounding maintenance of rotary-wing aircraft. Light-twin operating techniques and procedures were brilliantly discussed by J. Paul Jones of the CAA Aeronautical Center at Oklahoma City. Every light twin pilot or prospective pilot should get a copy of J. Paul's words of wisdom on both the advantages and the limitations of these fine aircraft.

Other speakers included Gill Robb Wilson, editor and publisher of Flying, Frances Nolde of DATA, Washington, who reminded the group that civil defense plans still incorporate general aviation aircraft, and George Weitz, CAA, Washington, who spearheaded an informative discussion on current maintenance problems.

What impressed us was the attendance this year of top echelon executives of some of our most successful

(Continued on page 42)

Business flying discussions on maintenance and operations included a session led by the group of panelists pictured at top left below. Other scenes show a few of the many industry exhibits of equipment which have made the Reading show a major event.

—(Reading Aviation Service Photos.)

Almost hidden by the tall timber, the Johnson DC-3 pictured landing at Moose Creek Ranger Station is landing while literally turning a corner. Turbulence restricts take-offs and landings to early morning and evening hours only at this Idaho strip, 100 miles east of Lewiston. —(International Harvester Photo.)

Wilderness Air Strip

JOHNSON Air Service of Missoula, Montana, has performed about as many different kinds of flying jobs as any operator. One of its most recent workouts was the airlifting of bulldozers, construction materials and fuel into a remote 2,600-ft. air strip 100 miles east of Lewiston, Idaho, at an "X" on the map called Moose Creek Ranger Station. Two International TD-9 crawler tractors with dozer blades cleared 25 acres of virgin timber and moved 56,520 yards of dirt to construct a new 4,100-ft. strip, 250 ft. wide. Johnson's DC-3 hauled in over 8,000 gals. of diesel fuel, 1,000 gals. of gas, 610 ft. of 18-in. pipe, 985 ft. of 8-in. pipe and 7,000 ft. of wire in addition to the two Internationals. The joint CAA-U. S. Forest Service project was contracted by Henry Vanderwall of Grangeville, Idaho, for $67,102. Moose Creek Ranger Station is in the heart of excellent big game hunting and fishing territory and is accessible only by air. Over 600 landings and take-offs made there last year are expected to be doubled this year.

Air photo (above) shows new 4,100-ft. strip and old 2,600-ft. strip at Moose Creek, with rugged terrain on all sides. Both are one-way strips. International tractors were disassembled for airlifting into the strip (below). Note Cessna in background at left.

—(International Harvester Photos.)

LIFE system centers on these two instruments, Nafli Director (attitude-command instrument) at top and Situation Display Indicator (position-displacement instrument) below it. Push-button panel pictured below contains mode selectors. Functions and detailed description of the two instruments are outlined on opposite page. While providing precise automatic control for IFR flying, the new Lear system places the major burden of coordination and anticipation on the instrumentation, freeing the human pilot for a better management of his aircraft in critical situations.

Push-Button F

By TOM ASHLEY

THE reader interested in multi-engine private, executive and airline precision instrument flying the push-button way can get a pretty good idea of what Lear's significant new L-5/LIFE system is by studying the instruments and controls and their descriptive data pictured on these pages. But we could sit here and study for hours without ever appreciating their full meaning until actually flying them in an airplane. So if this interests you, it will not mean much until you do just that, which is what we did with Bob Mays of the Lear staff.

Then, you will agree that the L-5/LIFE system's big achievement is that it puts the IFR pilot at complete ease, enabling him to do a precision job without tension or fatigue complicating critical situations. A demonstration enables the pilot to feel the system's smoothness and accuracy, to sense the disappearance of tension and in its place the build-up of self-confidence which the system's simplicity generates. You'll come away from a demonstration, as we did, anxious to give Lear credit for a substantial assist to the betterment of airmen and aircraft in performance.

The L-5/LIFE system is a combination of the Lear L-5 autopilot and a new package known as the Lear Integrated Flight Equipment. Autopilot gyros provide heading and attitude information for the LIFE instrumentation, resulting in substantial weight reduction. The L-5 autopilot amplifier uses tubes; the LIFE amplifier and approach coupler use transistors. The mode selector for LIFE and for the L-5 is the same, greatly simplifying the operation of both. Pitch, roll and direction are controlled to fly VOR and ILS approach paths without mental or physical effort. Lear quotes 76 lbs. as the installed weight and $16,575 as the price of the L-5-LIFE system.

The LIFE component of the package is a navigation instrument system which combines 3-axis attitude/command indication with full situation display. This display consists of two instruments. They place the major burden of coordination and anticipation on the instruments themselves — not on the human pilot.

Attitude/Command Instrument

One of the displays is the Nafli Di-

Mode Selector

LIFE MODES

When autopilot is on, LIFE Steering Bug directions become autopilot commands.

FLITE INSTRUMENT: Turns Steering Bug off. Nafli Director continues to display pitch, roll and direction information.

HEADING: Steering Bug directs smooth turn to selected heading.

CAPTURE: Push to capture a VOR or LOC course. No struggle to bracket. Steering Bug commands smooth interception of desired course line.

TRACKING: After course is captured, Tracking button gives automatic crosswind compensation to fly center of course. Read crab angle between Selected Course Index arrow and Lubber Line

L-5 MODES

ALTITUDE: Autopilot holds altitude of aircraft indicated at time button is pushed.

GLIDESLOPE: Push to have autopilot fly glideslope.

CANCEL: Cuts off automatic Glideslope or automatic Altitude control.

L-5 Flight Controller

TURN CONTROL

PITCH CONTROL

ON-OFF SWITCH

ROLL TRIM

L-5 Flight Controller

Flight With Lear L-5—LIFE System

rector, which is the system's attitude/command instrument. It is a primary pitch and roll displacement reference, positioned in the center of a magnetically-slaved azimuth card. Its attitude reference is a moving aircraft display, which climbs and rolls in response to maneuver or deviation from level attitude. The aircraft symbol in this instrument rolls in the same natural relation as the aircraft rolls — if you bank to the left, it banks to the left and its heading indication and angle of bank are displayed in correct relationship with the roll of the aircraft — it is as if you were looking at your airplane from behind. This makes it natural, hence the name "Nafli." This is different from the moving-horizon type of instrument, in which the angle of bank index goes in the reverse of the direction of turn.

Flying this instrument, you do not move your eyes elsewhere on the panel to coordinate heading because the Nafli also contains a moving azimuth card with an index at the top. At the top also is a heading pre-select "bug." When you set a new heading with the control knob, the bug moves around to the new heading on the azimuth and you steer into it to take up the new heading. This steering bug is simply a bank command and, whenever it deflects from center, the pilot banks his aircraft until the bank index matches the steering bug. By simply keeping these two indices matched, the aircraft will return to and maintain the proper attitude to make good a desired flight path.

Also in the Nafli instrument is a glideslope indication, represented by marks resembling tip tanks. Keep the aircraft symbol's wings lined up with them and you fly straight and level. Used for glideslope presentation in approaches, they become activated and you keep your wings lined up with them to come down the glide path.

Navigation Instrument

The second Lear instrument is the Situation Display Indicator. This is a primary navigation reference, also positioned in the center of a magnetically-slaved azimuth. It has displacement bars for the glideslope and the localizer, the latter also serving as the omni course needle. This VOR/LOC bar may be manually set for the desired path. Thus the instrument provides a graphic situation display, with a fixed aircraft symbol etched at the center on the dial glass. Arrows at the center give to-from indication. Warning flags indicate faulty signals for glideslope, gyro and VOR/LOC. The azimuth card may be manually disengaged by pulling out the Course Set Control knob in a second detent position. With this, the azimuth card and the inner display may be oriented at will and flown as a conventional crosspointer instrument without being slaved to the compass system.

Operation of the L-5/LIFE system is by seven modes, each obtained by push-button: (1) Heading mode provides smooth automatic maneuvering onto a selected heading with a 30-degree maximum bank and 60-degree maximum intercept approach angle; (2) capture mode introduces gradual interception and capture of an omni or localizer course; (3) tracking mode adds automatic cross-wind compensation to maintain centerline course after capture; (4) altitude mode controls the airplane to maintain the barometric altitude at the time the mode is actuated; (5) glideslope mode commands the automatic pilot to fly the glideslope; (6) flight instrument mode turns off the heading, capture and tracking modes, and (7) cancel mode cuts off automatic glideslope or automatic altitude control.

Nafli Director
Attitude-Command Instrument

LATERAL COMMAND (STEERING BUG) receives command intelligence from computer and moves right or left to command proper bank for selected flight path.

HEADING INDEX. Positioned on azimuth card by Heading Set Control. Rides with azimuth card and becomes reference for selected heading.

BANK INDEX indicates roll attitude. Permits easy matching to lateral command index.

ATTITUDE REFERENCE. Pictorial airplane climbs and rolls as though you were watching from behind.

AZIMUTH CARD repeats magnetically-slaved directional gyro information.

HEADING SET CONTROL positions Heading Index and provides heading signal for lateral command in Heading Mode.

BANK REFERENCE MARKS are level and 30-deg. bank indices etched on dial glass.

VERTICAL PATH REFERENCE for glideslope and level flight reference.

PITCH COMMAND (TIP TANKS). In ILS modes, these indicate glideslope displacement and supply command signal for smoothly intercepting and holding the glideslope.

PITCH TRIM CONTROL centers pictorial airplane for any pitch attitude plus or minus 5 degrees.

GLIDESLOPE DEVIATION DOTS

Situation Display Indicator
Position-Displacement Instrument

LUBBER LINE etched on dial glass. Rotating beneath it, azimuth card continuously displays magnetic heading.

AZIMUTH CARD repeats magnetically-slaved directional gyro information.

SELECTED COURSE INDEX indicates selected VOR radial or inbound course of localizer.

VOR "TO" STATION ARROW

AIRPLANE REFERENCE, etched on dial glass, is the airplane you are flying and shows its relation to the desired course (course displacement bar).

GLIDESLOPE WARNING FLAG indicates faulty signal from receiver.

VOR "FROM" STATION WINDOW

COURSE DISPLACEMENT BAR represents lateral path deviation.

COURSE DEVIATION DOTS

GLIDESLOPE DEVIATION BAR displays vertical path deviation.

GLIDESLOPE DEVIATION DOTS

RECIPROCAL COURSE INDEX

COURSE SET CONTROL positions VOR radial and localizer Selected Course Index.

GYRO WARNING FLAG indicates inoperative status of directional gyro system.

LOC/VOR WARNING FLAG indicates faulty signal from receiver.

A great airman finds inspiration for his final flight

The First Light

By Al Williams

EVER since my first solo during World War I, I have been "at home" in the air, and during the ensuing thirty odd years possessed of the fantasy that only by getting up aloft and alone could one maintain a true perspective of life and enjoy a sense of real freedom.

Up topside everything is always big and clean irrespective of whether Old Man Weather is smiling or angry. . . . A million roads are open. In my left hand is power. . . .In my right and at my feet is the selection of direction and attitude. Through no merit of mine I am far richer than the most fabulously wealthy emperor or king of old. . .playing among the clouds I have actually lived the dreams that only the most gifted poets of verse and song were barely able to sketch.

Swamps, rivers and even the ocean could be traversed without hindrance while sailing along the bottom of this atmospheric ocean. That land world down there below, where I had learned to walk and to live, with all its restrictions and complications in movement and in time, despite its pretensions to greatness, always seemed to suggest a hint that it was only a temporary home.

The grandeur of unlimited panorama aloft inevitably forces the logical question as to what force . . . . who . . . . had built and was regulating this magnificent stage setting. No one can avoid or shrug off the feeling of the nearness of the Author of it all . . . . of God . . . . in the face of the things he sees far above the land world.

Flight has always meant readjustment and peace of spirit for me. Particularly was this true as my responsibilities increased in an age of time-wasting conferences . . . . prolonged to frustration by men of little courage . . . . who await a hint from the boss as to the decision he wants them to make . . . . and the consequent responsibility he wants them to share with him. Times without number I have sought the heights to wash my mind of the corrosion of frustration.

Unable for days on end to obtain approval and authority to get at the jobs that all hands knew must be done . . . . meant teeth on edge . . . . tightened lips . . . . and temper just short of exploding for relief. Some unfortunates seek relief through dangerous expedients, others carry the frustration home with them and wind up as ulcer cases. The only safety valve for me, late of a Friday afternoon, was to get to the airport, climb into a fighter and get "upstairs" as fast as possible.

This is by no means a word-painted

picture but rather the mere recounting of memories and a factual description of reactions.

Ten or fifteen minutes topside . . . . climbing among and over towering white mountains . . . . diving into dark dead-end canyons where the sun couldn't reach . . . . then through steam which gradually brightened as we rushed into blazing sunlight . . . . on top of a white plain extending to far horizons . . . . always brought the same soothing reaction—of being at ease with myself.

A glimpse or two through an opening at the land world, its tallest buildings and most magnificient monuments seemed mere piles of children's play blocks . . . . its faint tracings of roads . . . . a mere thin silver ribbon marking the course of a great river . . . . completed the contrast of the two worlds.

Most refreshing of all was to take off in the face of a dreary, dripping overcast which locked the land world in gloomy light . . . . then the breakthrough into brilliant sunshine where everything was big and clean and bright.

Experiences and pictures such as these brought me to wondering why I ever bothered fussing and worrying about inconsequential little things down there while this fairyland of childhood up here was real, beautiful and serene as it had been and will be for more millions of centuries.

Until about twenty years ago, as one of the hapless "conformists," I had waited "up" for the first minutes of each new year. This meant that I was at least "awake"! But it was only static alertness. Then came the inspiration for going up to meet the new year on wings.

It was a bitter cold morning. The engine was cold, too, and sputtering its protest. Earth and sky matched each other in indigo as we taxied toward the take-off point.

Take-off for Tomorrow

The lights of the flying field were drab yellow imitations of the twinkling, clear-eyed stars far above. The little ship worked her way stiff-legged and importantly over the rough ground like an ill-tempered old somebody awakened too early. She shrugged her shoulders as each wheel crossed a frozen rut.

Little mirrors of ice gleamed along the dark runway ahead. Over-dressed with colored lights, to attract attention, the wind Tee pointed West. There was the wind.

The engine was fully warmed up by this time, and as the throttle was pushed wide open, the long yellow exhaust flames shortened, turning blue, and thundering forward we were off, climbing rapidly towards the East to greet the First Light of the New Year. . .

A few seconds . . . a thousand feet up. The big engine was slowed to fifteen hundred revolutions, to set propeller blades at a higher pitch angle so they could take big bites of the air. The landing gear was "up" and out of the way of progress . . . a long climb was "on."

Back over the tail were the lights of a great city and its sprawling satellite clusters . . . like a giant Christmas tree blown to the ground . . . its twinkling lights still burning. Dull yellow lines of light marked the main highways and their branches tapering off to isolated points that tried to hold the tip-design as if the decorators had run out of bulbs.

Dead ahead and all to the left was black. Off to the right was more black broken by a white line . . . the edge of the Atlantic Ocean.

In a few minutes the altimeter indicated eleven thousand feet and we were level with the ragged ridge of a dimly outlined cloud bank in the East. The engine became a bit rough . . . a little heat to the carburetor . . . an adjustment of the air mixture and it smoothed again.

At fifteen thousand feet the chill became a bit painful. . . no use bothering with the thermometer after it read zero. From here on up climbing was a serious business requiring extreme alertness, since there was no oxygen on board. What I could see, and what the instruments in front of me indicated, was only part of a problem which could become critical unless my interpretation and reactions to those readings were alertly precise. At eighteen thousand feet the engine again roughened . . . a little more of the same treatment to prevent icing of the carburetor and adjustment of the air mixture control was again the cure.

Hadn't done much altitude flying previous to this flight but was well aware of the danger signs to be checked. The first of these signs was that my breathing rate had increased in tempo and also in depth.

I cracked the cockpit canopy open about an inch for more air . . . but all thin and getting thinner. Then began the deeper breathing and the periodic compression of chest and upper body muscles in the hope that this ac-

(Continued on page 42)

EDITOR'S NOTE: Al Williams passed on to his final reward last month, a victim of cancer at the age of 61. Few contributed as much to aviation as did Al Williams during his lifetime of complete dedication. Al was a truly great pilot—one of those rare individuals who becomes a part of the airplane itself the moment he climbs into the cockpit. But Al was also many other things. He was an early outspoken champion of air power in the Billy Mitchell days, and it cost him dearly. Always at loggerheads with ground-bound brass and pipsqueak politicians, Al was an iconoclast of the old school and he fought with fire and passion for all he believed in and with unrelenting bitterness against all he thought were in the way of aviation development and national security. This great man needs no fancy words of praise at his going; he would not like it and besides, all who knew him fully realize his high place in aviation's hall of fame is secure. He lived a full and productive life and left the world a much better place for having passed this way. Just before he departed this life Al Williams started writing again—at our insistence. No more fitting epitaph to Al Williams could be found than the accompanying final prophetic piece from his own, now stilled hand.

Victory Over Auto Traffic

NORTHROP Aircraft executives are converting lost minutes into profit-making hours by using a helicopter for California inter-plant travel. Operating Monday through Friday on a fixed-schedule basis, the company-owned and operated Bell 47J Ranger makes eight flights daily. Rain or shine, smog or fog, the helicopter shuttles on schedule between the Northrop Division in Hawthorne and the Anaheim facilities of the Nortronics Division and the Radio-plane Division in Van Nuys. Travel time between plants is compressed from a one-hour bumper battle on the ground to a leisurely 18-minute helicopter flight, made in living room comfort.

In the first 13 months of operation from February, 1957, through March, 1958, the Bell Ranger made 1,802 trips, carrying 2,954 passengers and an estimated 45,050 pounds of urgent mail 56,540 miles.

Northrop's helicopter pilot, Willard D. Collup, says acceptance by Northrop executives of the inter-plant helicopter service has been enthusiastic. One obvious reason for the enthusiasm is the conservative estimate that 45 minutes is saved by each of the three passengers going from Hawthorne to Anaheim or Van Nuys. This can amount to as much as a total annual time saving of 4,680 man hours or 585 man days.

Other benefits derived from the helicopter service include regularity, photographic work, and other special assignments best suited for the helicopter's door-to-door, midair stop and go abilities. Dispatching functions are maintained by each facility served by the helicopter.

Summarizing the regularity of the first 13 months of operation, Pilot

This spectacular pattern of 4-level auto traffic symbolizes the growing surface traffic problem while businessmen glide over it in a 4-place helicopter used by Northrop Aircraft for efficient inter-plant travel. This is downtown Los Angeles interchange, where speedways from Hollywood, Pasadena, Santa Ana and the Harbor join.

—(Northrop Aircraft Photo.)

Collup said that only four days of helicopter flight operation were cancelled because of weather. In addition, only two trips were called back after take-off because of ground fog.

Credit for regularity belongs to the maintenance personnel responsible for the helicopter's care. Under the direction of Northrop Maintenance Foreman Orby Blair, a crew of mechanics, electrician and radio men share in the maintenance of the helicopter and other company aircraft.

The work of these men speaks for itself. Beside normal inspection checks at 300 and 600-hour intervals, only three flights have had to be cancelled for on-the-spot unscheduled maintenance. On one occasion, a safe autorotation landing was made when a fan belt failed. The passengers completed their trip by taxi.

From a safety standpoint Northrop officials point out seven reasons why the helicopter offers the most advantageous air transportation. They are: (1) fire in midair is almost unheard of; (2) navigation is by visual contact; (3) weather is much less of a problem because the helicopter's speed can be reduced as needed, even to zero speed while conditions ahead are checked; (4) the helicopter can be landed safely even with a complete power failure; (5) structural reliability of the Bell model is backed by more than 2,500,000 flying hours; (6) there are no special maintenance problems; and (7) midair collision is a minimum risk because of the Bell 47J's excellent pilot visibility and also because the whirling rotor is an eye-catcher for other aricraft pilots.

Northrop shuttles men between plants in its own 4-place Bell helicopter, shown at Hawthorne coming in near a mockup of the firm's new high-performance, small-size N-156F counter-air fighter for NATO and SEATO countries
—(Northrop Aircraft Photo.)

Northrop's helicopter service is a model of safety. Because they are entrusted daily with the responsibility of carrying top company executives from President Whitley C. Collins on down, and occasionally special guests — including Secretary of Defense Neil McElroy, General Jimmy Doolittle, Air Force Secretary James H. Douglas and others — flight procedures and routes are carefully followed.

Max Stanley, Northrop's chief of flight support operations, and Collup have laid out their routes so that the helicopter at normal flight altitude in the Los Angeles area is never more than four seconds from being in position for a safe autorotation (power off) landing. The helicopter's greatest safety feature, they emphasize, is that it can be landed with zero air speed — no forward motion.

Helicopter passengers are immune to Los Angeles' congested air traffic. Collup cites two reasons for this enviable condition. First, the helicopter almost always operates beneath 1,500 feet, which is below fixed-wing aircraft traffic. Secondly, by never flying in or parallel with fixed-wing aircraft approaches, unless under radio direction from the control authority, the helicopter cannot get involved in congested airplane traffic patterns.

"Flying a helicopter over Los Angeles is like having an uncongested freeway going in any direction you want to go," Collup said. "We cross Los Angeles eight times a day, fly over the smog and the automotive congestion below, and in one year's flight I have had to change course only once to avoid another aircraft," he added.

Here's Copter Pilot Will Collup (left) waiting for company men to board his Bell at the door of Northrop's Nortronics Division at Anaheim for a shuttle hop across town to another plant. He makes 8 trips daily.
—(Northrop Aircraft Photo.)

Another in a series on aircraft operation and maintenance . . . and why major service organizations, like the world's airlines, use **CHAMPION SPARK PLUGS.** *Noted aviation authority reports on* **LOCKHEED AIRCRAFT SERVICE . . .**

the LAS word

by HERB FISHER

International aviation authority, veteran test pilot, author

Lockheed Aircraft Service is the largest and oldest company in the world devoted to the maintenance, overhaul and modification of all aircraft types. Its facilities are said to be the most complete in the industry.

Since its founding in 1938 as the service division of Lockheed Aircraft Co., LAS has processed more than 55,000 aircraft — helicopters to 4-engine airliners, single-engine jets to 10-engine bombers.

Eleven years ago, Lockheed's service division was incorporated as a separate but wholly owned subsidiary company—LAS—to provide even better service for Lockheed planes as well as independent service for all types of other aircraft. Today, LAS itself has two subsidiaries—LAS-International and LAS-Overseas.

The accumulated technical experience of LAS is vested in four ultra-modern overhaul bases: at New York International; Oakland and Ontario, Calif., International Airports; and Honolulu Airport.

LAS has pioneered complete engineering and manufacturing functions in several significant post-war developments:

First Constellation and DC-6 conversion to high-density interiors . . . The first U.S. military cycle-reconditioning program . . . First airline fleet maintenance and overhaul on a fixed-price-per-flight-hour formula . . . First helicopter conversion to scheduled passenger service . . . First major military jet maintenance program . . . First major airframe conversion of radar picket aircraft . . . Maintenance and overhaul support of airline and military fleets on the Berlin and Pacific Airlifts . . . First B-26 conversion to executive aircraft.

Military and commercial aircraft serviced by LAS are flying in every corner of the world—over all oceans, deserts, jungles, the Antarctic. LAS-O follows up with world-wide technical assistance. LAS emergency teams repair damaged aircraft at accident sites anywhere.

Herb Fisher

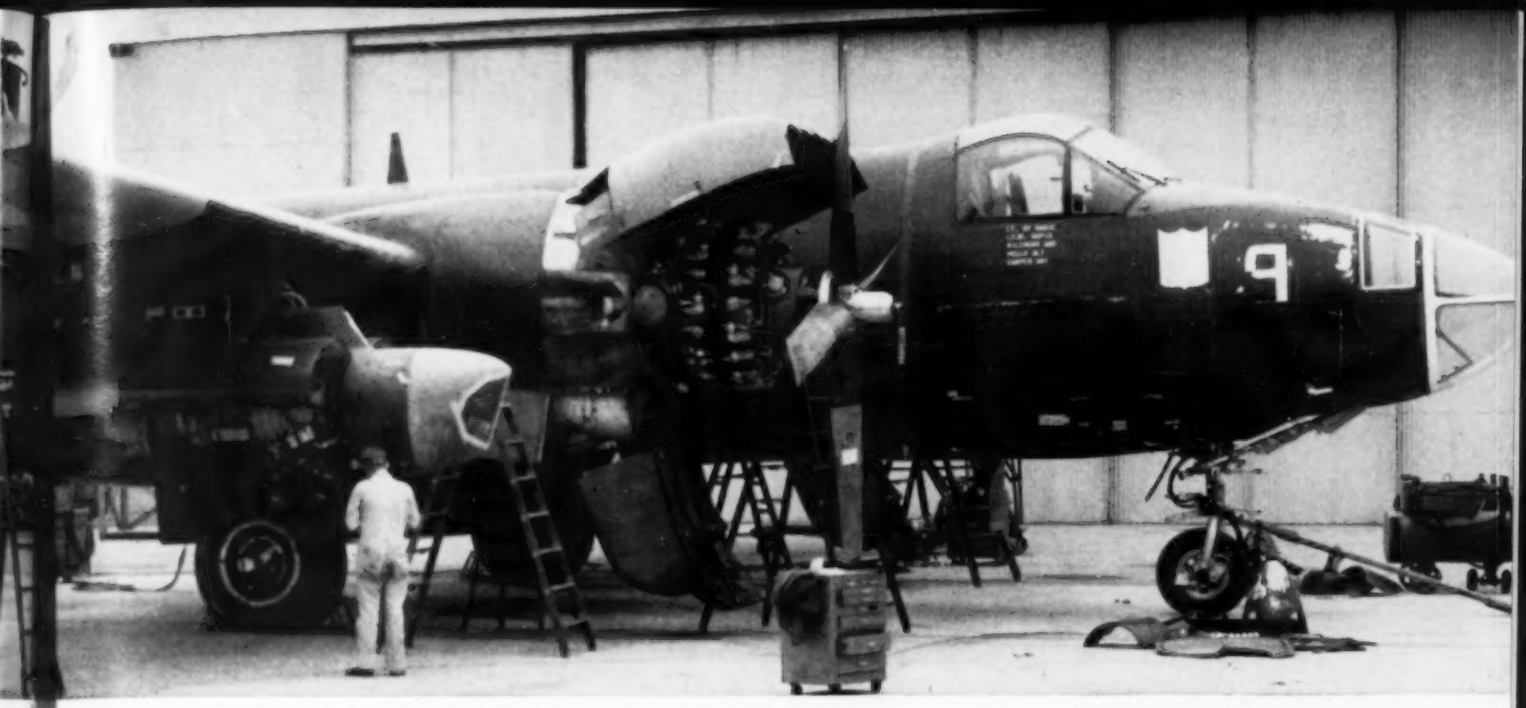
LAS' customer roster since the war has embraced almost every major international air carrier flying into the United States, as well as major U.S. domestic carriers and the Air Force and Navy, including the entire East Coast fleets of Airborne Early Warning aircraft. Overseas, LAS-O has assisted Japan in major aircraft and jet-engine overhaul programs, plus manufacture of T-33 trainers. A current technical assistance and materiel program involves Japan's 22-million-dollar manufacturing of anti-sub patrol aircraft.

In World War II, LAS operated seven major overhaul and modification installations, repairing 22,500 battle-damaged craft alone plus modifying and servicing thousands of others.

In the Korean War, LAS modified and rebuilt hundreds of planes.

This extensive variation in aircraft type and operational pattern by LAS

New 400-hour maintenance cycle for WV-2 Early Warning picket aircraft is performed at LAS-Honolulu, which has 27 shops.



Navy P2V-7 is modified at LAS-Ontario for 100-below "Operation Deep Freeze" in Antarctica.

customers is testimony to the company's experience level and the ready adaptation of its personnel and facilities to individual maintenance requirements. In this, the Champion Spark Plug plays a vital dual role:

First, LAS services a great many of the major airlines of the world. *In their exhaustive flight evaluations of every available spark plug, the airlines have repeatedly proved that Champions are best for reliability, service, economy. All the major airlines of the world fly with Champions.*

Second, as LAS President J. Kenneth Hull told me: "At LAS we must combine diversified know-how with only the finest first-line quality products in order to maintain our record of on-schedule deliveries of airworthy aircraft."

J. Chase, Vice President and LAS-I Base Manager, said: "Our customers depend on the finest quality plugs for peak engine performance throughout a *wide* heat range, whether operating in dry desert heat, jungle humidity or severe Arctic cold."

Foreign and domestic commercial planes plus U.S. military aircraft are serviced at LAS-I, New York International, largest East Coast independent maintenance facility.

Fisher (l) interviews LAS President J. Kenneth Hull (r) and W. J. Weisbruch, Acting Plant Superintendent.

Paul Kovac, Senior LAS-I Powerplant Engineer, said: "Plugs may be affected by anything that goes wrong with an engine. If a plug is out of heat range, if it has a tendency to preignite or foul, schedule delays will follow. *Champions have proven their excellent quality control on our test- and flight-lines.* They're mechanically strong and do not experience core nose ceramic failures. We've found Champion a quality standard in an industry that *knows* high standards."

LAS' unique service program — Equalized Maintenance, Aircraft Rotation, planned spare-parts inventory and fixed-price-per-flight-hour formula—assures commercial and military operators maximum flight utilization through minimum ground time. The LAS Equalized Maintenance plan was applied to Early Warning aircraft, a marked departure from traditional military maintenance programs, to provide the USAF with higher utilization and operational flexibility.

Among Lockheed's earliest service jobs were modifications for such aviation greats as Amelia Earhart, Lindbergh, Sir Hubert Wilkins. Recently, LAS "royalized" a plane for His Majesty Haile Selassie, Emperor of Ethiopia, by installation of luxurious movable compartments—one of the most unusual conversion jobs in air transport history.

CHAMPION SPARK PLUG CO.
TOLEDO 1, OHIO

J. L. "Pete" Peters (l), Flight Line Dept. Head, recommends Champions for cars and planes. His Champion-fired Thunderbird won 35 trophies. Pilot is Capt. Edward Schank, LAS-USAF Acceptance Officer.

Alti-Cruiser Shakedown Cruise

The man who perfected it reports on first pressurized light twin's first big trip

By TED R. SMITH
Vice President, Engineering and Development, Aero Design and Engineering Co.

WE took the production prototype Alti-Cruiser on an engineering shakedown cruise for a personal check on its cabin pressurization and air conditioning systems, mechanical details of the various new instrument arrangements, and of its radio package. All of these features are not only new to Aero Commanders but to the entire business aviation industry. They have created widespread interest because the Alti-Cruiser is the industry's first business twin to be marketed with pressurized cabin comforts including air conditioning.

I can report that our prototype Alti-Cruiser has now logged well over 250 hours of cold weather and hot weather operations and that its systems have all functioned admirably, combining to make Alti-Cruiser flying a very marvelous experience.

Our shakedown cruise will give an idea of what we mean. In addition to the writer, we had aboard George Pew, our Aero Design president; Ward Fuller, our chief project engineer-design, and Jim Fox, our radio installation engineer. Our flight was from Aero Design's Engineering and Development Division headquarters at Norman, Oklahoma, to Santa Monica, California, and return.

Outbound, we routed our flight from Norman to Albuquerque to Santa Monica, leaving Norman at 2:35 p. m. in poor weather with ceilings 700-800 ft. and with light drizzle. Airways Traffic Control cleared us to 12,000 ft. We would have preferred 15,000 ft., but headwinds from 270 degrees (our course was 250 degrees) were 30 knots at 15,000 and only about 20-plus knots at 12,000.

Upon leaving 3,000 ft. in our climb, we turned the cabin pressure rate controller to 500 feet per minute, dialing the cabin altitude controller to a cabin altitude of 6,500 ft., turning the air conditioning selector switch to "flight automatic" and turning the pressurization switch to "pressurize." The heater switch was placed in the "on" position and the cabin temperature controller was set for a comfortable range in contrast to the outside air temperature of minus 10 degrees C.

Now let's see what happened. Within about 6 minutes the cabin pressure differential gauge showed the cabin to be at the full 2-lb. differential. The controller held our cabin altitude precisely to the desired 6,500-ft. level while we leveled off and set up our cruise at an airplane altitude of 12,000 ft. We were on top and out in the clear, having climbed through several cloud layers.

Squared away, we could devote full time to studying the Alti-Cruiser's completeness in the way of dual instrumentation and equipment. Engine instruments are grouped in the panel's center with complete flight instrumentation on both pilot's and co-pilot's panels. The pilot's instrument panel contains electric gyros and a General Electric gyro compass while the co-pilot's panel contains a full flight group with air-driven gyros. Radio communication and navigation controls are on a panel just under the glare shield and above the instrument panels.

Alti-Cruiser N7200 has a very complete radio and navigation package. It consists of two 360-channel transmitters, one 560-channel communications receiver, two navigation receivers with RMI adapters, one glideslope receiver, one 3-light marker beacon receiver and one ADF receiver. All are Wilcox units except the ADF, which is Collins and which has a flush-mounted loop.

Navigation system presentation is through two Omni-Mag cross-pointers on the pilot's side and two standard ID 48 cross-pointers in parallel on the co-pilot's side. An RMI indicator is on the pilot's side and co-pilot's side — each giving a presentation from one of the navigation receivers. A needle for the ADF presentation is combined in this instrument.

Another feature of the Alti-Cruiser is its complete flush-mounted antenna systems for all except the ADF sense antenna. Omni antennas are located in each wing tip, the two VHF communications antennas are located inside the vertical fin tip, and the ADF loop antenna is flush on the bottom of the fuselage. Our trip proved the flush antenna systems to be extremely accurate and sensitive.

For our landing at Albuquerque, we set up on the controller a cabin descent rate of 500 feet per minute and left the altitude control set at 6,500 ft. for the cabin as we let down from our 12,000-ft. cruise altitude. Therefore our cabin was depressurized as we reached 6,500 ft., and upon reaching 6,500 ft., we turned the air conditioning selector switch to "ram air," cycled the heater switch once again to energize the heater under ram air conditions and turned the pressurization switch to "off."

It was cold weather in the late spring, so upon landing we changed the air-conditioning selector switch to the "ground heat" position in order to maintain cabin temperature until our passengers had deplaned. On trips in hot weather, this air-conditioning selector switch is turned to the ground cooling position on landing and the

Here's a new portrait of the Alti-Cruiser atop the overcast, showing almost complete absence of exterior antennas. With two 340-hp. supercharged Lycomings, the 7,500-lb. Alti-Cruiser cruises 230 mph. at 16,000 ft. on 32 gph. and has 223-gal. fuel supply. In production at Oklahoma City, its $183,700 price and 4,950-lb. empty weight include about $85,000 worth of pressurization, air-conditioning, heating, radio, electronic, engine and other equipment and deluxe interior with lavatory and toilet. Alti-Cruiser is industry's first pressurized and air-conditioned light business twin.

—(Aero Design Photo by Wayne Entriken.)

system maintains a very comfortable, air-conditioned cabin on the ground, even with outside air temperatures over 100 degrees F.

On the ground at Albuquerque, a check of everything showed the Alti-Cruiser had averaged a flat 200 mph. for ground speed from take-off, including climb and descent, despite the strong headwind. Cruising air speed at 12,000 ft. was 215 mph. true, using 60% hp. (2,550 rpm. and 30 ins. of manifold pressure). This 60% power, it should be said, includes about 8 hp. from each engine absorbed by the pressurization system. Each of the supercharged 340-hp. Lycomings drives a hydraulic motor for the pressurization system.

We filed an IFR flight plan for Santa Monica and again asked for and received 12,000 ft. for our cruising altitude, setting up the same sequence on the cabin controller that we had used at the start of the trip. Darkness came an hour and a half after taking off from Albuquerque and gave us an opportunity to evaluate the Alti-Cruiser's interesting and very effective new panel and instrument lighting. All instrument faces are of a new series and have the new MIL Spec matte white dialing. We found this a notable improvement because it gives much greater definition to instrument readings.

Back to our flying, we used our nose lights to confirm suspicions of precipitation shortly after passing over Needles — the lights showed that the air was well saturated with ice crystals. This soon put us in and out of clouds over the Fontana Marker and we could see lightning flashes ahead. Everything broke loose at once in a cloud we entered just before reaching Ontario. Its severe turbulence and a flood of ice and hail pounding our windshield told us we must have been in the center of a rapidly-developing thunderstorm cell. We had our hands full for a few minutes, with props throwing ice chunks. Such unexpected conditions gave us an excellent opportunity to experience very severe weather inside a fully-pressurized Alti-Cruiser cabin.

The boys in the Los Angeles Approach Control had their hands full, too, as everybody in the area wanted down. Thanks to smooth traffic handling, we were stair-stepped down from altitude in short minutes. For our descent, we rolled our cabin altitude control for 1,000 ft. to keep our cabin descent rate at only 500 fpm. We broke into the clear at 1,700 ft., cancelled our IFR and were cleared to destination at Santa Monica, being depressurized by the time we were downwind and ready for landing checks. Here we found the Alti-Cruiser's new standard-equipment retractable wing landing lights very versatile — they can be varied in angle for varying approach conditions and are excellent for taxiing.

During the trip West, we had made cabin temperature surveys which showed the Alti-Cruiser's Barber-Coleman automatic controller had held temperature throughout the cabin to a maximum variation of only 2 degrees F. This is extreme fineness of control.

We found the Alti-Cruiser's Wilcox radio systems to work extremely well — coupled with our internal VOR antennas, it gave us an omni range in excess of 125 miles at 12,000 ft. and a communications range of at least 100 miles at 12,000 ft. and below.

Our trip survey proved that the Alti-Cruiser's noise level in the cabin is at least 10% quieter than in the standard 680 Commander — most of this improvement is due to the sealed and pressurized cabin coupled with a reduction of air noise over the entire

(Continued on page 46)

TURBINE-POWERED SIKORSKY S-62 is pictured operating on water. It has flying-boat hull with main gear mounted in outrigger floats. Note how engine installation atop fuselage clears cockpit for cabin access. New 10-12-passenger machine is "wedding" of new fuselage and turbine with time-proved mechanical components of S-55.

Sikorsky's New S-62

HELICOPTER operators are becoming acquainted with the many benefits promised by shaft-turbine power plants from demonstrations of the new Sikorsky S-62, developed to replace the Sikorsky S-55 but using that aerial workhorse's time-proved mechanical components. Commercial deliveries of the S-62 and retrofits for traded-in S-55's are offered for 1959 by Sikorsky Aircraft.

The first amphibious helicopter ever built with a flying-boat hull, the S-62 has been developed around the new lightweight General Electric T-58 shafted turbine, which is in the 1,000-hp. class, but S-62's and S-55 retrofits will be available with either T-58 or Lycoming T-53 turbines.

The 10-12-passenger S-62 was built with a flying-boat hull and amphibious landing gear for versatility achieved only at a penalty in performance and costs by helicopters equipped with accessory floats. The hull's V bottom cushions impact in water landings, throwing spray outwards and down. Main wheels are mounted under outrigger floats which resist pitching and rolling on the water. Sikorsky says the S-62 hull weighs less than a land-type hull equipped with inflated pontoons and eliminates much drag associated with pontoons. Water handling is superior with the hull.

Useful load of the S-62 is 2,950 lbs. at a gross weight of 7,500 lbs. and an empty weight of 4,550 lbs. Cruising speed is said to average 105 mph., with a maximum speed of 117 mph.

Turbine power is said to give the S-62 a payload 700 lbs. greater than that of the piston-powered S-55 and the S-62 is 20 mph. faster in cruising speed. The T-58 turbine weighs only one-third as much as the piston engine in the S-55, and the turbine is mounted atop the fuselage well above water spray and dust. This turbine location provides cockpit access from the cabin. Turbine smoothness and location contribute to greatly improved cockpit and cabin quietness and comfort.

A major benefit from turbine power is the availability of rated engine power up to an altitude of 17,000 ft., providing unequalled hovering capabilities at altitude.

Numerous advantages accrue to the S-62 from the use of proven S-55 mechanical components having extended overhaul periods four to five times longer than normally expected of new components. Over one million flight hours by almost 1,200 S-55's proved up these components, which include all main and tail rotor heads and blades; main, intermediate and tail gear boxes; shafting; tail rotor pylons, and major portions of flight control and hydraulic systems.

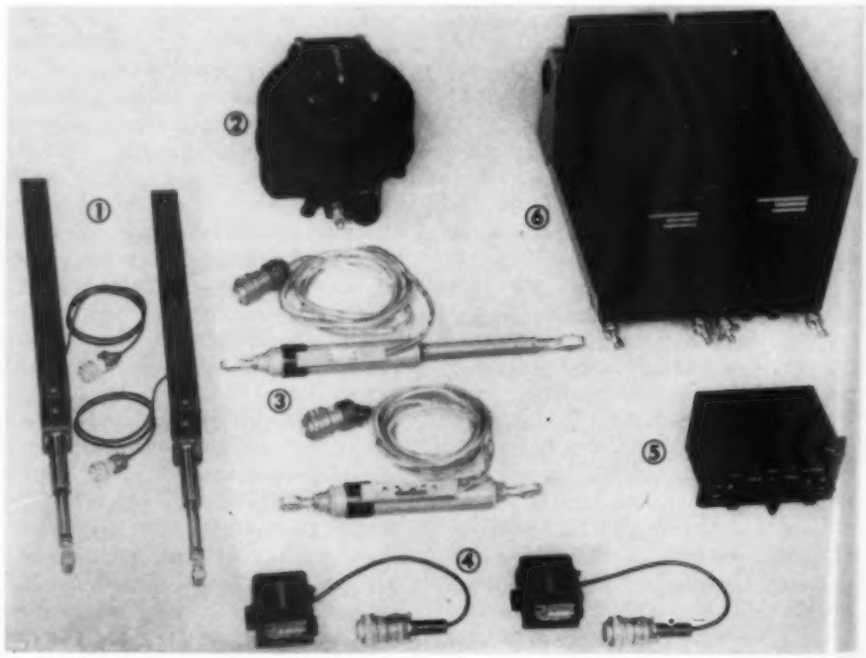
Owners of S-55's and their equivalent military counterparts can turn them in for retrofits by Sikorsky, the factory installing the mechanical components of the turned-in S-55's on the new S-62 airframe along with a gas turbine engine. This program will enable both civilian and military operators the world over to utilize large inventories of S-55 spare parts already on hand.

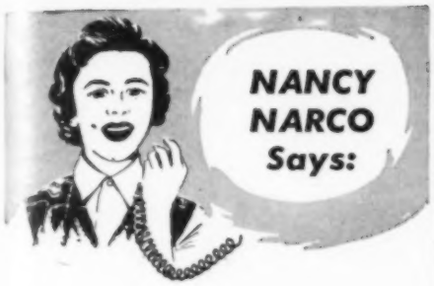
Deliveries of S-62's and retrofits in 1959 are contingent on the availability of turbine engines at acceptable pricing and with proven dependability, said J. E. Beighle, Sikorsky sales manager.

Sperry Automatic Control for Copters

Automatic electronic stability control for all types of helicopters has been developed by Sperry Gyroscope Company and first operational units are going into Vertol Model 44 copters for the Swedish Navy. The Sperry system weighs less than 40 lbs. installed. Its components, pictured at right, are: (1) *bungee pick-offs for centering control stick and converting pilot-applied stick forces into electrical outputs;* (2) *vertical gyro for pitch-roll reference;* (3) *force links to convert collective stick and rudder forces into electrical outputs;* (4) *linear accelerometers to sense lateral and longitudinal accelerations;* (5) *controller;* (6) *amplifiers, including altitude sensor, for automatic control on any or all axes.*

—(Sperry Photo.)





Whistle Stop

"WHISTLE STOP" tuning is one of the greatest innovations to hit the low-cost aircraft radio market. It was first introduced by Narco in the Simplexer VHF transceiver, and has since been incorporated in the Omnigator Mk II and the Narco VTA-3, 27-channel transmitter. Some other radio manufacturers have adopted the system, too.

"WHISTLE STOP" tuning gives you positive, crystal-calibrated tuning to the frequency you wish to receive on. It saves all the problem of asking for a short count or fiddling back and forth with the tuning dial until you get the tower. With "whistle stop" tuning you can set up Simplex communications almost as easily as if you had a crystal-controlled receiver.

HERE'S HOW IT WORKS. Let's say the tower talks on 119.5 megacycles. You set your transmitter on 119.5, then activate the "whistle stop" function. On the Omnigator you turn the function knob to CAL. On the Simplexer and VTA-3, you pull out a button. This makes your transmitter put out a short-range signal on 119.5 mc which can be picked up by your receiver.

THEN ALL YOU DO is turn your tuning dial until you hear a loud hum or whistle. Tune it to maximum tone and you know your receiver is precisely tuned to 119.5. Then push the "whistle stop" button in or turn the Omnigator knob from CAL to COMM or VOR and you're in business.

NEEDLESS TO SAY, this saves a lot of time and trouble when you're switching from one communications channel to another, such as from tower to ground control. It's a great invention.

THERE ARE A FEW TRICKS you can do with "whistle stop" tuning, if your airplane is equipped with several transmitters or receivers. For instance, any VHF receiver can be "whistle stop" tuned to any transmitter in the airplane, even if the two radios are across the cockpit from each other. For instance, if you have an auxiliary VHF receiver, you can set it up on ground control prior to entering the traffic pattern, then leave it on standby until ready to use.

IF YOU HAVEN'T had a chance to fly with "whistle stop" tuning, you'll get quite a kick out of the added ease and simplicity which it gives you.

Happy megacycles,

Nancy

NARCO • Fort Washington, Pa.

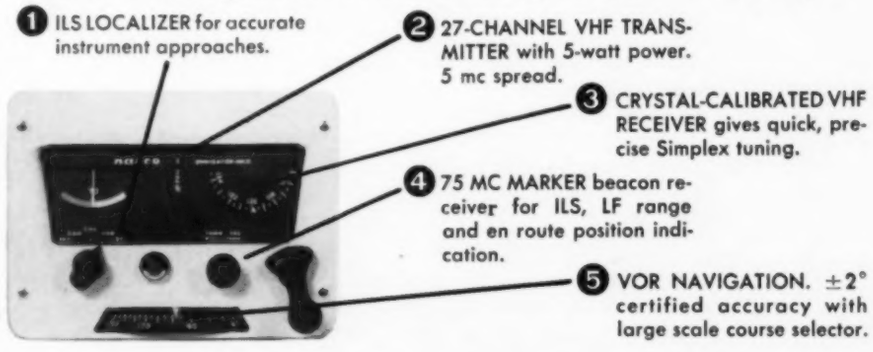
narco omnigator mk II

More Narco Omnigators are in use in business aircraft, operating IFR and VFR, than any other radio unit. More Narco Omnigators are being built and sold than any other unit of its type.

Pilot confidence and respect, built up over the years for the Omnigator's accuracy, reliability and five-way usefulness, explain this overwhelming choice.

Weighing only 18 pounds, complete with separate power supply, the Omnigator Mk II provides five different navigation and communications functions in a single, space-saving, easily installed unit.

the omnigator mk II helps you 5 ways


1 ILS LOCALIZER for accurate instrument approaches.
2 27-CHANNEL VHF TRANSMITTER with 5-watt power. 5 mc spread.
3 CRYSTAL-CALIBRATED VHF RECEIVER gives quick, precise Simplex tuning.
4 75 MC MARKER beacon receiver for ILS, LF range and en route position indication.
5 VOR NAVIGATION. ±2° certified accuracy with large scale course selector.

the perfect pair—dual omnigators

Dual Omnigator Mk II installations are becoming increasingly popular as the perfect answer for dual navigation and communications units for IFR reliability. This combination gives you 54-crystal transmitter capacity with all basic frequencies duplicated, dual VOR, dual ILS localizer, dual 75 mc marker beacon, dual VHF receivers—all at extremely moderate cost, light weight and with traditional Omnigator reliability.

narco NATIONAL AERONAUTICAL CORPORATION
FORT WASHINGTON, PENNSYLVANIA

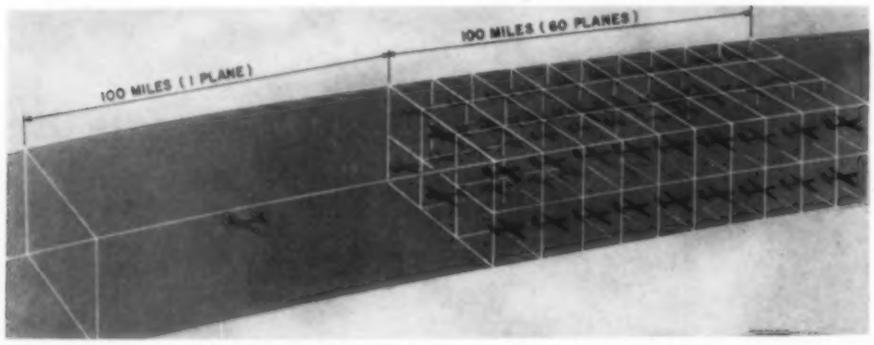
JUST AMONG OURSELVES

(Continued from page 18)

boards isolate the real cause — for future correction — rather than write off an accident with a simple, pointed mental-blockading accusation of "pilot error." Pilots who deserve disciplinary action or prosecution should get it with thoroughness. But those who are at no fault should not be made the scapegoat for somebody else's failure or negligence.

Studies of accident records are made misleading and worthless when statistics are based on mere codes instead of actual factors involved in each separate accident. How can crew training, aircraft design, equipment development, traffic control and other activities profit in the promotion of safety when accounting machines rattle off a maze of coded marks which hide the true facts? Many people and their skills are involved when a pilot finds no way out of situations compounded through no fault of his own — equipment complications, confused traffic orders, aerodynamic shortcomings, inadequate ramp or shop servicing and the like can and do cause accidents by rendering a pilot helpless. But these factors are difficult and frequently impossible to uncover after an accident. Yet their existence and eventual elimination are just as necessary for air safety as faultless piloting.

Congratulations to the Navy for its action banishing the term "pilot error" and its determination to bring all factors as well as the pilot into proper perspective! We believe better air safety will result. That is important to everybody in aviation.

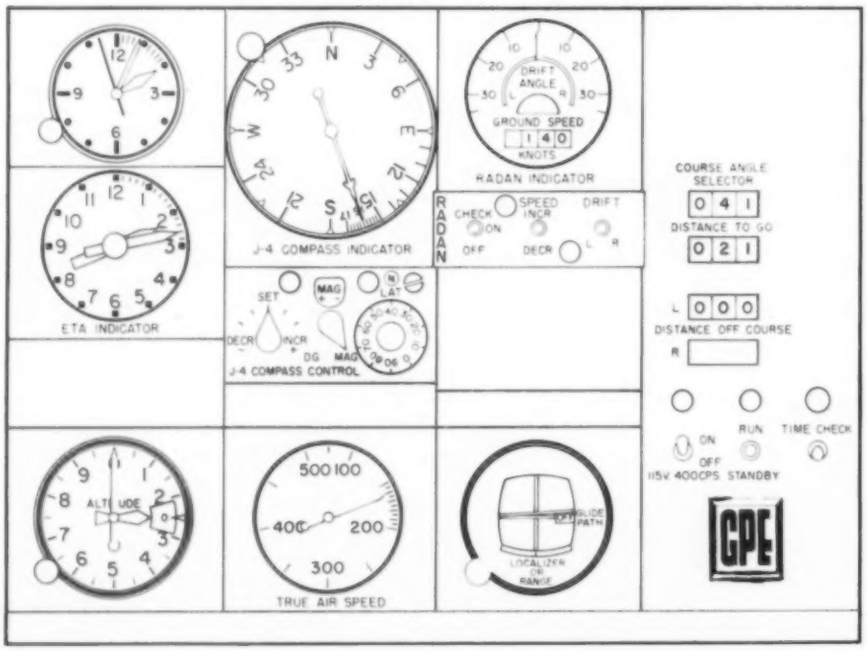


New airborne system provides such precise navigation that 60 jet transports at 600-mph. can use same 100-mile block of reserved air space now required by single 600-mph. transport using present equipment (above). Pairs of microwave beams radiated from aircraft to ground (right) provide Doppler-effect calculation of true ground speed, drift angle and course deviation for precise navigation.

High Density Air Navigation System

FEATURING automatic, self-contained equipment carried in the airplane itself, a new high density air navigation (HIDAN) system is being demonstrated by General Precision Equipment Co. It makes practical use in air traffic control of Doppler-radar calculation of true ground speed, drift angle and course deviation. The airborne system has two main components — an 89-lb. RADAN automatic navigator in production for the Air Force since 1948 and a panel presentation component which calculates the aircraft's divergence from its planned position and shows the pilot what he must do to return to and maintain his position.

HIDAN panel shows pilot on clock at left what time he will reach next checkpoint or destination, drift angle on upper right dial, and distance to go and distance off course (numeral counters).



Airmen's Calendar

July 8-11—Institute of Aeronautical Sciences National Summer Meeting, Ambassador Hotel, Los Angeles.

July 18-20—2nd Annual Dallas Jaycee Air Fair, Dallas-Garland Airport, Dallas.

July 20-Aug. 10—Canadian National Soaring Meet, Americans Invited, Brantford, Ontario.

July 24-25—Association of Local and Territorial Airlines Quarterly Meeting, Denver, Colo.

July 27—4th International Air Show, Bellingham, Wash.

Aug. 7-9—National Convention, OX5 Club of America, Hotel Statler, Los Angeles; Jimmie Mattern, Chairman.

Aug. 11-14—13th Annual Flying Farmers National Convention, New Yorker Hotel, New York.

Aug. 23-24—4th Annual Portland Jaycee Air Fair, Portland, Ore.

Aug. 23-24—Florida Aero Club Annual Convention, Orlando.

Aug. 25-27—National Flying Club Association 3rd Annual Convention, Roosevelt Hotel, Hollywood; tie-downs and transportation at Glendale Grand Central Airport. Robert Shaffer, chairman, 1004 Hamline Place, Burbank.

Aug. 31-Sept. 1—$7,000 Midget Racers Air Meet and Air Show, Ft. Wayne, Indiana.

Sept. 1-7—British Aircraft Constructors Flying Display and Exhibition, Farnborough, England.

Sept. 25-27—5th Annual National Western Forum, American Helicopter Society, Ambassador Hotel, Los Angeles.

Sept. 25—Massachusetts Aviation Conference, Lawrence, Mass.

NARCO SAPPHIRE 1016A chosen for U.S. AIR FORCE L-27's

To provide versatile and complete VHF coverage for the sleek new 210 mph Cessna L-27's for the United States Air Force, the Narco Sapphire 1016 all-channel VHF transmitter and receiver was selected. Installed in the first 80 L-27's delivered by Cessna Aircraft Company to the Air Force, the Sapphire 1016 has been re-specified for installation in a second group of L-27's recently ordered.

The Narco Sapphire 1016, already in scheduled airline service with Capital Airlines and Chicago Helicopter Airways and in use in hundreds of executive aircraft, is rapidly gaining recognition as a far superior communications unit. If you are in the market for equipment to give you complete frequency coverage with high performance and reliability at a sensible price, look into the Sapphire 1016. See your Narco dealer or write for brochure.

FOR MAXIMUM NAV/COMM FLEXIBILITY - NARCO *Sapphire* 1016A

TSO'd for scheduled airline use. Provides automatic crystal-controlled operation (SCS or DCS), or independent transmitter and receiver crystal selection, with optional dual control heads. Receiver range covers 108 to 135.95 mc including all NAV frequencies permitting crystal-controlled NAV tuning when VOR/ILS NAV unit, such as Narco VOA-3, is attached.

Send for brochure and data on amazing new "2½ Sapphire 1016" system.

narco — National Aeronautical Corporation, Fort Washington, Pennsylvania

MARK OF THE FINEST COMMUNICATIONS

Sapphire 1016A

90/360-CHANNEL TRANSMITTER
90/560-CHANNEL RECEIVER

READING TOPS AGAIN

(Continued from page 26)

aeronautical enterprises. The best example of this attendance was in the Lear booth where Bill Lear, Paul Momenteller, Ed Conklin and Walt St. John personally explained the newest Lear products, most important of which was the Lear integrated flight equipment, which also was demonstrated in flight to many of the executive pilots.

In passing out the annual awards Alfred M. (Sime) Bertolet, president of Reading Aviation Service, admitted that this year's meeting topped all the previous ones and that allocating two days instead of one probably turned the trick and will be duplicated next year.

"On the whole I was elated with the success of the affair," Bertolet told us. "First, it was my impression that we had more good airplanes of the heavy and light twin type which produce a high quality though limited audience. Second, even though we made a pitch to have greater numbers of light single-engine owners present, the number was not nearly up to expectation. I had thought that with the weather we enjoyed the sky would be dark and the field covered with single-engine aircraft. Next year we'll do better."

Bertolet also reported that United Airlines' 8-hour course in the use of airborne weather radar and interpretation of radar scope images received excellent response from pilots in attendance. An enrollment fee of $75 was charged to defray expense of the course.

Members of the RAS staff besides Bertolet who deserve a real solid pat on the back for putting on such a successful meeting include Charlie Melville, show director; Art Horst, program coordinator; and Charlie Kerper, contest director. There were so many fine airplanes entered in all categories we felt sincere sympathy for the judges whose job this year was tougher than ever.—G.E.H.

Tipsy Nipper's Volkswagon Engine Details

VOLKSWAGEN ENGINE in new Belgian kit plane, the tricycle-gear Tipsy Nipper single-seater being perfected by Avions Fairey, S.A., at Gosselies, Belgium, delivers 33 hp. at 3,400 rpm. for take-off at sea level and 29 hp. at 2,900 rpm. for cruising. Fuel consumption at cruising power is only 2.25 gals. (8.5 litres) per hour. The modified Volkswagen engine, adapted from the popular German auto, has a displacement of only 72 cubic inches, with a 64-mm. stroke and a 77-mm. bore. It is equipped with a Scintilla OK 4L10, 11N magneto, a Solex 28 PCI carburetor and a Volkswagen fuel pump. These details are from E. O. Tips, managing director of the Belgium firm. He says the Volkswagen engine has not been fully approved for aircraft use "but we hope that shortly we will obtain a fully-approved engine of suitable price, weight, etc. which will put this aircraft into the fully-certified category." So far, only a small batch of pre-production prototype Nippers have been built. They are undergoing intensive test programs, both static and flying, with a view of obtaining a certificate of airworthiness for the airframe only, Tips told FLIGHT MAGAZINE. He said the little Nipper's wing structure has withstood a loading of over 8G during official static tests. The Nipper weighs only 360 lbs. empty, grosses 660 lbs., takes off and lands at 38 mph., using 450 ft. for take-off and only 300 ft. for landing, cruises 65 mph. and has a 75-mph. top speed. A sales price of less than $3,000, including engine and propeller, is planned.

Small 33-hp. Volkswagen engine is seen in this new photo of the single-place Tipsy Nipper kit plane. Empty weight of 360 lbs. includes engine, mass-produced in Germany for autos.

THE FIRST LIGHT

(Continued from page 31)

tion might force the thin air through my lungs. Knew it couldn't help much, but at least it was something to do and trying to keep check of developments kept my mind warm.

Sunrise at 20,000 Feet

At twenty thousand feet I forgot the cold. Deep breathing . . . the checking of the ship's altitude and the instrument readings and the horizon dead ahead were the only important items.

The last altimeter reading indicated a little bit past twenty-one thousand feet . . . and just when I was beginning to wonder how long I could tolerate the low oxygen menace. . .

There was the sun! From a strangely low angle it seemed to pop up at us! The plane's chromium sheathing gleamed and flashed and the vividly-colored orange wings took on new life.

"Good morning, New Year. We came to meet you, and escort you to a dark sleeping land world!"

I had seen many sunrises from the air, but this was an entirely different sunrise because the purpose of this flight was entirely different from that of all other flights. Memories of this one are still bright.

All kinds of brilliant color schemes flooded the horizon of this newest day. The upper rim of the sun was golden yellow from the start. The air was crystal clear in this big world far

from the little land world.

Mission accomplished . . . there were moments for thinking . . . not too many. Was I reading the instruments correctly at this low-oxygen altitude? I had tried this self-checking before many times . . . but with little success. Altitude does strange things to people. Some laugh foolishly . . . some others become angry . . . with little reason. I was amused with the thought that my mind was evidently trying to get inside itself for a check-up on operations but couldn't see its image without some kind of a mirror.

Nevertheless, there was the First Light of the First Day of a New Year. We had come to meet this first light neither to beg nor to bargain . . . we had indeed climbed upward and forward to meet it for whatever it might hold!

By this time the sun was busy with production day-making. Down below tidal waves of gray light were sweeping over the wide blackness and the yellow man-made lights alike.

I tired of forced breathing. It was time to go home. . . We turned to the West . . . motor throttled . . . more heat to the carburetor . . . as the plane nosed over into a steep glide toward the haven of heavy air. Man was designed to operate on the surface. Too far above it or too far below it he must bring his own air.

It is amusing to watch an altimeter in a diving ship try to keep up with the actual loss of altitude . . . 250 . . . 300 . . . 360 miles an hour straight down . . . with its readings lagging at least a thousand feet. There is no describing the sensation of riding a plane vertically.

At a few thousand feet . . . circling the field . . . fuzzy, dull lights were poking along below. Undoubtedly belated celebrants returning home from New Year's Eve parties. I couldn't help but grin and wonder if their faces matched their weary-looking yellow car lights.

A lazy climbing turn . . . the prop is set to low pitch . . . down goes the landing gear and the little ship lands on the runway as lightly as the wings of the morning.

A New Pattern of Thinking

I shall never forget that first mission of climbing and moving forward to meet the first light of a new year—it set a new pattern of thinking for the rest of my days.

And now sentenced to semi-ground-line status with only an occasional flight, I was standing on the shore of a wide expanse of water waiting to greet the First Light of the First Day of 1958. There is no explanation for what prompted the taking of several steps forward as the First Light peeped over the horizon.

Perhaps those few instinctive steps forward toward the First Light of a New Year's sunrise may be symbolic of the last flight we must all make . . . no wings . . . no motors . . . no instruments . . . nothing . . . *no help except the great power and lifting strength of prayer* . . . for the courage to take off bravely toward the "First Light of Eternity."

I know what my prayer will be before the wheels leave the runway.

"Please God, extend your compassionate hand over my beloved *ground crew*, and give me courage."

Forty-passenger, 280-mph. Fairchild F-27 is powered by two Rolls-Royce Dart propjets, each rated at 1,600 hp. plus 160-hp. jet thrust. Note whitewall tires.
—(Fairchild Aircraft Photo.)

Fairchild Begins F-27 Deliveries

THE first U. S.-manufactured propjet airliner was delivered last month to the first of 15 airlines and 13 corporations ordering it. In ceremonies at Hagerstown, Maryland, Lt. Gen. James H. Doolittle, distinguished airman and Shell Oil vice president, dedicated the first F-27 Friendship delivered by Fairchild Aircraft, and emphasized its significant role in establishing a new era for short-medium-haul airlines. The first delivery was to West Coast Airlines, which has ordered 6 F-27's for its routes serving 44 Pacific Northwest cities. West Coast and Fairchild presented a four-year aero-engineering scholarship to a Wenatchee, Washington, youth, Jay W. Hamilton. On display was the first of 8 F-27's soon to go to Piedmont Airlines, and other F-27's were in production.

Fairchild F-27 has span of 95 ft. 2 ins., length of 77 ft. 2 ins., height of 27 ft. 6 ins., 34,520-lb. gross weight, 22,237-lb. empty weight and 1,320-gal. fuel capacity. High wing gives passengers exceptional visibility.
—(Fairchild Aircraft Photo.)

AUTHORIZED
Cessna
SERVICE

These Authorized Stations Feature Flat-Rate Service

The Air-Oasis Co.
2601 E. Spring St.
Long Beach 6, Calif.

Aircraft Sales Company
Meacham Field
Fort Worth, Texas

Champ's Aviation, Inc.
Municipal Airport
El Paso and Lubbock, Texas

Clinton Aviation Company
Stapleton Airfield
Denver, Colorado

Cruse Aviation, Inc.
International Airport
and Clover Field Airport
Houston, Texas

Dal-Tex Aviation, Inc.
Highland Park Airport and Love Field
Dallas, Texas

Hair Flying Service
Harding Field
Baton Rouge, Louisiana

Poelman Aircraft Co.
New Orleans Airport
New Orleans, Louisiana

Ragsdale Flying Service
Municipal Airport
Austin, Texas

Kenneth Starnes Aviation Service
Adams Field
Little Rock, Arkansas

Southwestern Skyways, Inc.
Municipal Airport
Santa Fe, New Mexico
and Ogden, Utah

Sunny South Aircraft Service, Inc.
Broward International Airport
Fort Lauderdale, Florida

Walston Aviation, Inc.
Civic Memorial Airport
East Alton, Illinois

Yingling Aircraft, Inc.
Municipal Airport
Wichita, Kansas

SERVICE SATISFACTION

SMILING SERVICE is what you expect and always receive when our Authorized Cessna Service Stations solve your maintenance needs! We furnish factory skills, factory equipment and factory satisfaction. Cessnas are our specialty . . . and we follow a policy of giving Cessna users a little more, a little better service — LIKE OUR FAMOUS 1-2-3 CESSNA FLAT-RATE SERVICE!

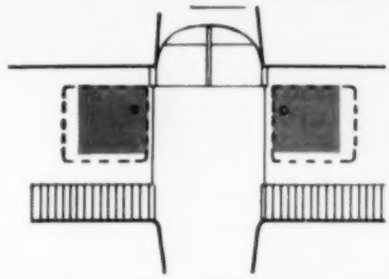
1 You get an accurately quoted price and time-required quotation based on hundreds of job studies covering virtually all maintenance needs.

2 You get genuine Cessna parts and factory-trained workmanship.

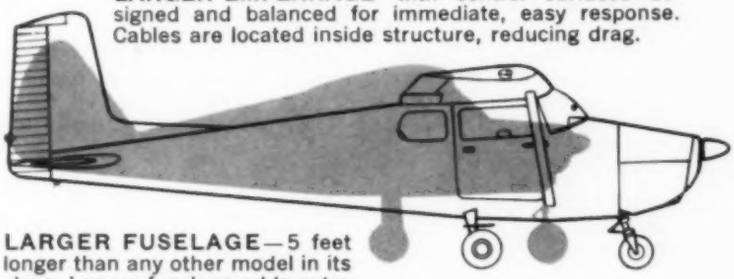
3 You save money and time and we stand behind every job for your fullest satisfaction.

NEW FULL-SIZE, ALL-METAL CESSNA 172 FOR '58

IMPORTANT: The modern design of the larger, roomier, more stable Cessna 172 offers you speeds comparable with other airplanes in the low-price field.



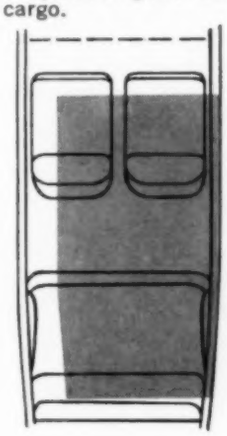
LARGER EMPENNAGE—with control surfaces designed and balanced for immediate, easy response. Cables are located inside structure, reducing drag.



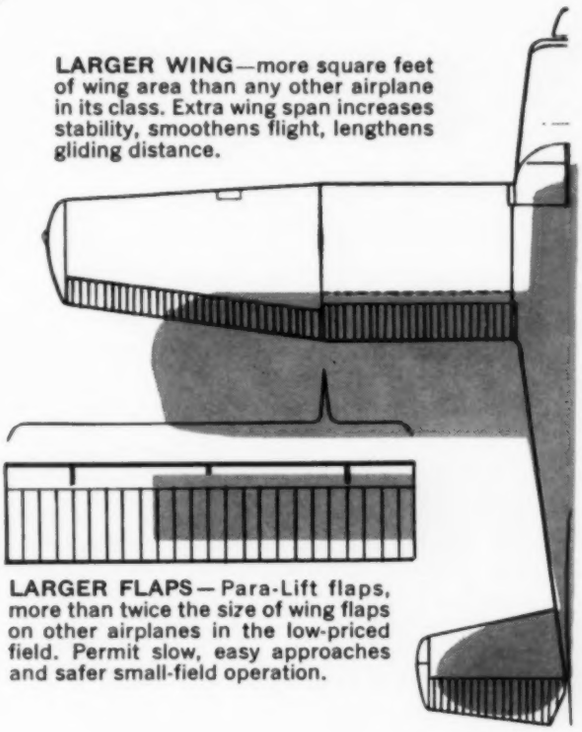
MORE FUEL CAPACITY— 42 gallons. Fuel can be easily drawn from one or both wing tanks. Selector valve located between front seats for easy access to either seat.

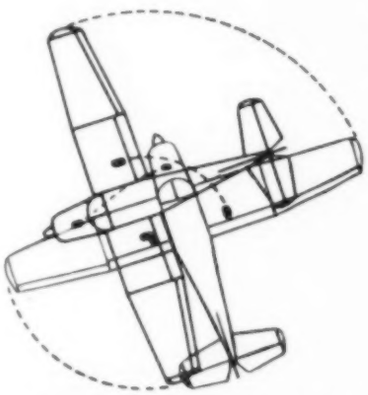
LARGER FUSELAGE—5 feet longer than any other model in its class. Longer fuselage adds extra stability, extra roominess for passenger comfort on long flights.

LARGER CABIN—with new interior design, new comfort features, new fabric, new color for 1958. All-metal 172 has two yard-wide cabin doors for easy loading of passengers and cargo.



LARGER WING—more square feet of wing area than any other airplane in its class. Extra wing span increases stability, smoothens flight, lengthens gliding distance.





EASIER TURNING—Cessna's famous patented Land-O-Matic landing gear is engineered for ground stability, taxiing, easier landings and take-offs. Includes fully steerable nose wheel and individual toe brakes.

LARGER FLAPS— Para-Lift flaps, more than twice the size of wing flaps on other airplanes in the low-priced field. Permit slow, easy approaches and safer small-field operation.

MOST SPACE AND STABILITY IN ITS CLASS

For full-size performance, full-size comfort—here's the only full-size airplane in the low-price class: 1958's new, *all-metal* Cessna 172! Most *relaxing* proof of its larger size is a roomy interior newly designed for 1958. New executive-type styling, new luxurious fabrics, form-fitting adjustable seats (both front and rear), plus many other features, make the cabin of the Cessna 172 the most comfortable as well as the most spacious in its class.

The new 172 offers the most stability in its class, too. Plus patented Land-O-Matic—a wide-span, spring steel landing gear that reaches out as if it owned the runway—for easy "drive-in" landings, "drive-up" take-offs. Price: $8[illegible]5 with std. equip., f.a.f. Wichita. See your Cessna dealer (Yellow Pages of phone book), or write CESSNA AIRCRAFT COMPANY, Dept. FM-27, Wichita, Kansas. Inquire about Cessna Lease Plans.

The only full-size airplane in the low-price class

6 GREAT CESSNAS 172 175 180 182 SKYLANE 310 THE COMPLETE AIR FLEET FOR EVERY BUSINESS NEED

ALTI-CRUISER

(Continued from page 37)

aircraft from the extraordinary aerodynamic cleanness of the Alti-Cruiser and its internal antennas and mirror-smooth paint job. The Alti-Cruiser's enclosed antennas and special paint job seem to have provided an increase of 8 to 10 mph. in cruise speed at altitude — this is worth working for in aircraft improvement. All Alti-Cruisers have the enclosed antennas and special paint job, the latter being some 10 coats of filler compound plus 18 coats of lacquer — hand-rubbed to an extremely smooth, aerodynamically-clean surface. It really pays off, we found.

Responsible for the development of the Alti-Cruiser's internal antenna systems are our friends and distributors at Santa Monica Aviation, Jack Baumann, Duke Effinger and other members of their staff. Their fine facility includes one of the country's best radio shops. They introduced us to another of Jack Baumann's new developments — a flush navigation light, which we plan to incorporate on all production Alti-Cruisers because it is a worthwhile improvement.

Returning from the Coast, we had more interesting opportunities for evaluation of the Alti-Cruiser in actual conditions. We filed for IFR nonstop from Santa Monica to Oklahoma City. Heavy traffic delayed our takeoff considerably and forced on us several holdings and a round-about departure routing which eventually led us to San Diego before taking us to our flight-plan cruise altitude of 15,000 ft. We departed Santa Monica in light rain with moderate to low ceilings and we found our hydraulic windshield wiper works very well, providing an unrestricted vision area across the windshield and about 14 inches deep. This is standard equipment on the Alti-Cruiser.

Pilots will find the Alti-Cruiser's cabin controller very simple and easy to operate for precise cabin conditions in obtaining desired pressurization levels, rates of climb, air conditioning and temperature control. After leaving the Omni on our IFR departure from Santa Monica, we set the controller for a cabin level of 1,000 ft., set cabin climb for a rate of 500 fpm., switched the air-conditioning to "flight automatic" and turned the pressurization switch to "on." When we got to 5,000 ft., we were still showing a 1,000-ft. cabin altitude so we set the cabin controller for a 6,000-ft. cabin as we began climbing to 12,000 ft., and we dialed for a 9,000-ft. cabin as we left 12 headed for 15,000, our cruise altitude.

This was over San Diego, and in accordance with our clearance. There we found VFR conditions — but our IFR departure and holdings plus a 30-minute delay for ATC clearance at the end of the runway, had stretched a normal VFR hop from Santa Monica to San Diego of 40 minutes into a little over 1 hr. of flying.

Once squared away and cruised out, El Paso came up in a short time. At 15,000 ft., using 2,550 rpm. and 28 inches manifold pressure, which is only 57% of power, our true air speed was 222 mph. and this was boosted to a 243-mph. ground speed by winds of 20 knots from 250 degrees.

A trip like this is made all the more comfortable by the Alti-Cruiser's lavatory and wash basin with running water and hot coffee.

It dawned on us while enjoying all of the Alti-Cruiser's extras that we had not made a rapid letdown, so we cancelled our IFR flight plan as Lubbock came up, pushed the nose over into a 2,000-fpm. rate of descent at 230-mph. indicated air speed and set the cabin pressure controller for a 4,000-ft. cabin altitude. Our calculations showed it would take us 5.5 minutes to reach 4,000 ft., where we would want to be depressurized, and this meant that our cabin had to lose only 5,000 ft. while the airplane was losing 11,000 ft., so our cabin rate of descent was only 920 fpm. while the airplane was descending 2,000 fpm. Had we chosen to descend the airplane at 1,000 fpm. for 11 minutes, our cabin descent would have been only 450 fpm. With the Alti-Cruiser, the pilot can choose many practical combinations to suit a wide range of operational needs.

We landed out of our rapid descent and enjoyed a meal at Lubbock, completing our trip to our office at Norman, Oklahoma, 1 hr. 14 mins. out of Lubbock.

It was an inspiration to take the Alti-Cruiser out on an evaluation trip during which practically all possible conditions were encountered. The airplane and its pressurization system had both performed exactly as required by all of the specifications developed for it in Aero Design's perfection of the Alti-Cruiser as a great step forward in executive flying. We were the first in aviation history to make a cross-country trip in a certificated pressurized aircraft in the category and size of the Aero Commander.

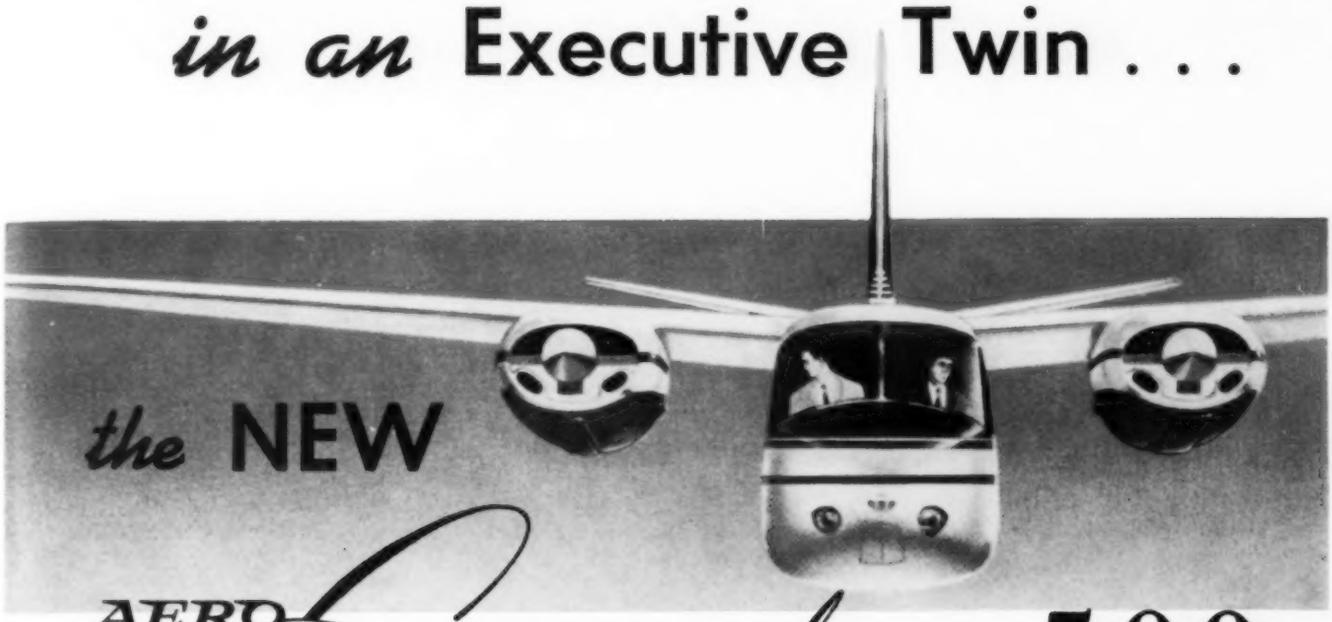
We say the airplane's performance and that of its systems were inspiring because everything we enjoyed represented achievement of what we at Aero Design are continually striving for — the utmost in combining performance, safety and comfort for those who fly the business aircraft fleets of America, always observant of those necessities that make a better business aircraft operation and, too, always cognizant of business demands for economy in operation.

At Aero Design we have the greatest faith in the future of business aircraft. We're proud to be among those in the industry to whom business people look to provide efficient aircraft for today and tomorrow. These are the things brought to mind by the Alti-Cruiser's performance on our evaluation trip. This airplane is an important milestone in business flying development.

COMPLETE FLUSH ANTENNA SYSTEMS for all Aero Commanders are being marketed by Santa Monica Aviation, Santa Monica, Calif., Aero Commander distributors whose electronic shop developed the flush antenna system on the Alti-Cruiser. The system includes two omni antennas for wingtip enclosure, two new wingtips with flush navigation lights, two broadband communications antennas and new vertical fin cap with rotating beacon provisions. Jack Baumann of Santa Monica Aviation says buried antennas provide improved radio performance as well as reduced drag and freedom from icing.

Greatest **VALUE**

in an Executive Twin . . .



the NEW AERO *Commander* 500

The NEW Aero Commander 500 is truly the greatest value in today's executive twin engine aircraft

The model 500 is a full-sized, 7-place Aero Commander competitively priced with the so-called "cheaper twins." Yet, it provides many exclusive and superior features as well as the famous Aero Commander high-wing performance and stability.

The 500 excells its competitors:

- **10% Slower Stalling Speed**
- **Over 400 Pounds More Useful Load**
- **13% More Range**
- **Higher Service Ceiling**

NEW, LOW COST! The new Aero Commander 500 delivers for $62,500 and offers more payload pounds per dollar than either of its nearest competitive aircraft.

COMPARISON CHART

PERFORMANCE	AIRPLANE "A"	AIRPLANE "B"	AIRPLANE "C"
MAXIMUM GROSS WEIGHT	6000 LBS.	4000 LBS.	4700 LBS.
EMPTY WEIGHT	3850 LBS.	2580 LBS.	2965 LBS.
USEFUL LOAD	2150 LBS.	1420 LBS.	1735 LBS.
CRUISING SPEED @ 70% PWR	285 MPH	196 MPH	213 MPH
STALLING SPEED – GEAR & FLAPS DOWN	63 MPH	70 MPH	69 MPH
RANGE @ 55% PWR. W/30 MIN. RESERVE	1100 MILES	976 MILES	891 MILES
NORMAL FUEL CAPACITY	156 GAL.	84 GAL.	100 GAL.
SERVICE CEILING – 2 ENGINES	24000 FT.	19300 FT.	20500 FT.
SERVICE CEILING – SINGLE ENGINE	8000 FT.	6200 FT.	7750 FT.
INITIAL RATE OF CLIMB – 2 ENG. @ S.L.	1400 FT./MIN.	1360 FT./MIN.	1660 FT./MIN.
INITIAL RATE OF CLIMB – 1 ENG. @ S.L.	310 FT./MIN.	225 FT./MIN.	415 FT./MIN.
TAKE OFF DISTANCE OVER 50' OBSTACLE	1250 FT.	1025 FT.	1405 FT.
LANDING DISTANCE OVER 50' OBSTACLE	1350 FT.	950 FT.	1720 FT.

Compare the model 500 (listed under airplane "A" above) with other new twin engine aircraft of comparable price to reveal the outstanding values built into this great new Aero Commander.

BROWN AERO CORP | **MIDLAND AERO CORP**

DALLAS AND TYLER, TEXAS • MONROE, LOUISIANA
DALLAS — LOVE FIELD • P. O. BOX 35124 • FL 1-3990
TYLER — POUNDS FIELD • P. O. BOX 3031 • 2-5389
MONROE — SELMAN FIELD • P. O. BOX 2791 • FA 2-6262

MIDLAND AIR TERMINAL • MIDLAND, TEXAS
P. O. BOX 336 • TERMINAL, TEXAS
MIDLAND, MU 2-8714 • ODESSA, FE 2-7101

YOU *trade* **AUTO ~~BUY~~ NOW-**

YOU *Plane* **OUGHT TO!**

There's no better time than right now to trade in your used airplane for a brand new 1958 Tri-Pacer.

New, liberalized time payment or lease-purchase plans make it simple to step up to a new, modern, trouble-free four-place Tri-Pacer with more speed, more comfort, far greater reliability.

Your Piper dealer is ready to trade right now. More likely than not, your present airplane will more than cover the down payment.

Listed below are the monthly payments for a brand new 160 hp. Piper Tri-Pacer if you trade in your airplane:

If the trade-in value of your airplane is:	Your monthly payments would be:
$2500	$248
$3500	$216
$4500	$184
$5500	$152
$6500	$120

Or you can buy a 160 horsepower 1958 Tri-Pacer, priced at only $8595, for

$2318 DOWN
$254 per month

See your Piper dealer, or for more information send in the coupon below:

PIPER AIRCRAFT CORP. Lock Haven, Pa. 7-F

I presently own a_____

Please send me the following:
- ☐ Name of nearest Piper dealer.
- ☐ 1958 Tri-Pacer brochure and complete price and equipment list.
- ☐ Brochure on ☐ Piper Comanche ☐ Piper Apache ☐ Piper Super Cub

Name_____

Address_____

I'LL TAKE ONE EACH — AND TWO LITTLE 'UNS — so said Gerry Francis (left), Beech distributor at Lansing, Michigan, when he and his associates picked up over $300,000 worth of twin-engine Beechcrafts at the factory recently. They took home a Super 18, a D50A Twin-Bonanza and two Travel Airs. With Francis left to right, are Virgil Cline, Robert Fleming and Vincent Dostert. They had one Travel Air already sold to Detroit Engraving Co., will use other three as demonstrators. —(Beech Photo.)

AIR REPORT

(Continued from page 5)

lbs., the T-58 powers the Sikorsky S-61 and S-62 and the Kaman HU2K-1, all helicopters.

TEN NEW TWIN-TURBINE VERTOL TRANSPORT HELICOPTERS will be manufactured by Vertol Aircraft at Morton, Pa., under an $8,000,000 letter contract for the Navy funded by the Army. Seven of the Model 107 Vertols will be powered by twin General Electric T-58 turbines for 2,050 shp. per helicopter and three with twin Lycoming T-53 turbines totalling 1,650 hp. per helicopter. The Vertol 107 will make routine all-weather flying practical in helicopters.

HELIO COURIER PRODUCTION HAS BEEN RESUMED at Pittsburg, Kansas, following a month's shutdown for vacations and new tooling which increases production capacity. . . .

NEW OWNER-DEALER SALES PLAN provides that an owner of a Helio Courier can regain 97.5 per cent of the airplane's cost through commissions on sales of six planes plus discount allowed on the purchase of the original airplane. Lynn Bollinger, Helio president, said the new plan "enables a corporation or an individual with part-time use for an airplane to utilize the remaining time of the pilot and the Helio Courier to demonstrate to potential buyers and

(Continued on page 52)

Airfoil-Shaped Dispenser

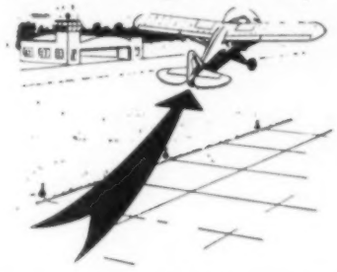
A new Swathmaster ag chemical dispenser, invented by Joe Sellers of Bakersfield and manufactured by Transland Aircraft of Torrance, California, has perforated airfoil-shaped panels and will dispense dust, spray, seed or fertilizer with no equipment changeover. Swaths are 33 to 100-ft. width and pilot can apply spray at 1 gal. per acre on one pass and 180 gals per acre on next swath. It has no moving parts except flow regulator, gate and agitator — it eliminates normal plumbing, pumps, valves, booms and nozzles.

YOU CAN'T SEE SUPERIOR PERFORMANCE

BUT YOU SURE CAN FEEL IT!

Some features of an airplane you can *see* from inspection, but the most important feature of all—performance—you seldom *see*. You've got to *feel* it... *feel* it in actual flight, *feel* it under critical conditions. Performance is the only proof of promise.

You see many fine, attractive aspects of the Piper Tri-Pacer, but the Tri-Pacer's #1 feature—**unmatched performance in flight**—can only be *felt*.



The *feeling* begins the moment you open the throttle of the husky, 160 horsepower Lycoming. The surge you *feel* as you're airborne tells you you're in fast, but pleasant, company. You *feel* the **superior climb** as you watch the altimeter wind up, and up.

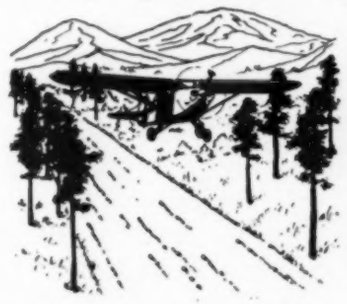
The Tri-Pacer is famous the world over for its **stability,** but nobody's ever *seen* it. You have to *feel* it when, with wheel full back, trying to stall, nothing happens. The Tri-Pacer just sits there steady as a rock, mushing forward with full aileron control.

You can't *see* the **rough air superiority** of the Tri-Pacer. Come to think of it, you can't *feel* it, either—except by comparison with other airplanes in similar rough air conditions. Then you discover that the short-span, compact design of the Tri-Pacer gives you the smoothest ride.

Comfort and quiet? You can't *see* them, but you know they're there at the end of a thousand-mile trip. Then you know the Tri-Pacer was designed for relaxing cross-country travel.

You don't *see* the Tri-Pacer's **speed,** until you fly alongside other aircraft in the same class. Then you really *can see* that the Tri-Pacer is faster... measurably faster.

You can't *see* the astonishing **ease of flying and landing** a Tri-Pacer, but you *feel* it first time you circle the field. Simplified, interconnected controls take the work out of flying; flaps give you a nice, comfortable approach; Hydrasorb tricycle gear makes landing almost automatic.



Under least favorable conditions you can't *see* the Tri-Pacer's **extra performance.** You *feel* it, though, on a hot, lift-less summer day... on a short or rough runway... taking off from a high altitude strip. Here the Tri-Pacer's extra "zip" really pays off in performance.

You can't *see* the **reliability and stamina of the Lycoming engine.** But you *feel* it in the confidence you know you can place in this best of all light plane engines.

When you're in the market for **safe, economical transportation,** don't just look and listen. Check the features that determine an airplane's true character—fly it, and *feel* for yourself. Then you'll discover that the Tri-Pacer is the airplane for you.

For a demonstration flight see your Piper dealer, or write for Tri-Pacer brochure, Dept. 7-F, Piper Aircraft Corporation, Lock Haven, Pennsylvania.

PIPER *Tri-Pacer*

World's Most Popular Low Cost 4-Place Business Airplane

MORE PEOPLE HAVE BOUGHT PIPERS THAN ANY OTHER PLANE IN THE WORLD

HERE'S THE SIGN OF THE FINEST SERVICE FOR YOUR PIPER AIRPLANE

Piper has established a world-wide network of Factory-Certified Service Centers to assure you of the finest service possible for your Piper airplane.
To earn the coveted designation, service organizations must meet rigid requirements, must be properly equipped and staffed by personnel who have attended the intensive service school conducted at the Piper plant.
Dozens of Piper Factory-Certified Service Centers have been established throughout the nation and around the world, and more are being designated to assure convenient and competent Piper service wherever you may wish to fly.

FOR THE BEST IN PIPER SERVICE AND MAINTENANCE VISIT THE PIPER FACTORY-CERTIFIED SERVICE CENTERS LISTED BELOW

ANDERSON AVIATION CO., INC.
Sky Harbor Airport
P. O. Box 5175
BRidge 5-5741
Phoenix, Arizona

AVIATION SPECIALTIES COMPANY
Gallup Municipal Airport
P. O. Box 1241
UNion 3-3621 *UNion* 3-5394
Gallup, New Mexico

BROWNING AERIAL SERVICE
Municipal Airport
P. O. Box 1173
HOmstead 5-1728
Austin, Texas

DELAWARE AVIATION CORPORATION
Philadelphia International Airport
P. O. Box 5340
SAratoga 7-6000
TWX Ph. 520
Philadelphia 42, Pennsylvania

ELLIOTT FLYING SERVICE, INC.
Davenport Municipal Airport
P. O. Box 418
2-2689
Davenport, Iowa

EXECUTIVE AIRMOTIVE, INCORPORATED
Stewart Air Park
P. O. Box 70
GArfield 8-3581, *GArfield* 2-7277
Parkersburg, West Virginia

J & J AIRCRAFT, INC.
Sarasota-Bradenton Airport
821 *General Arnold Road*
ELgin 5-6868
Sarasota, Florida

KEN-MAR AIRPARK, INC.
Ken-Mar Airpark
Box 2667, *University Station*
MUrray 3-6589
Wichita, Kansas

LOUISIANA AIRCRAFT
Downtown Airport
P. O. Box 1428
WAlnut 1-9618
Baton Rouge, Louisiana

OKLAHOMA AIRCRAFT SALES CO.
Ponca City Municipal Airport
P. O. Box 709
ROgers 5-3375
Ponca City, Oklahoma

RED AIRCRAFT SERVICE, INC.
Broward County International Airport, Building 78
JAckson 3-9624
Fort Lauderdale, Florida

SKYMOTIVE, INC.
O'Hare Field, Chicago International Airport
Chicago Telephone NAtional 5-6969
P. O. Box 448, Park Ridge, Illinois

SOUTHERN FLIGHT SERVICE, INC.
Douglas Municipal Airport
P. O. Box 1211
EXchange 9-6374
Charlotte, N. C.

SPARTAN AIRCRAFT COMPANY
Aviation Service Division
Tulsa Municipal Airport
TEmple 5-4491
Tulsa, Oklahoma

ST. LOUIS FLYING SERVICE
Lambert Municipal Airport
Box 6067, *Lambert Field Station*
PErshing 1-0450 & *PErshing* 1-1770
St. Louis, Missouri

Get there FAST the Easy Way

. . . with the
Mitchell Automatic Pilot
An All Transistor Autopilot

The most significant electronic advance in the last 10 years — Now comes to private and business aviation with an all-transistor autopilot system that has won the acclaim of every pilot who has flown it.

CHECK THESE FEATURES . . .

- Light Weight (8.2# installed)
- Simplest Installation
- 3-Directional
- Smoothest & Most Dependable
- One Degree Accuracy
- Low Power Drain—1/10 amp at quiescense
- One year Guarantee
- Low Price: $2425.00—12 Volt unit
  $2625.00—28 Volt Unit

CAA Approved For: Apaches, Bonanzas, Cessnas 172-180-182-310, Navion, Twin Navion, Comanche. (Pending: Twin-Bonanza, Travelair & Aero Commander).

Mitchell Automatic Pilot

Authorized National Distributors • Contact your Dealer for Demonstration

GENERAL AIRCRAFT SUPPLY CORP.
City Airport, Detroit, Michigan

AVIATION SUPPLY CORP.
111 South Franklin St., Tampa, Florida
Municipal Airport, Atlanta, Georgia

THE DON HORN COMPANY
Box 3736, Lamar Station, Memphis, Tennessee

GENERAL AVIATION SUPPLY COMPANY:

Lambert Field
St. Louis, Missouri

Will Rogers Field
Oklahoma City, Oklahoma

Love Field
Dallas, Texas

Sky Harbor Airport
Phoenix, Arizona

Municipal Airport
Houston, Texas

PEACEFUL MEETING OF AMERICAN AND RUSSIAN JETS occurred last month at Vancouver International Airport's British Columbia Centennial Aviation Show when a Boeing 707 and a Tupolev TU-104 were displayed. Communist transport weighs 156,000 lbs., has two jet engines, carries 50 passengers 495 mph. Boeing 707 grosses 247,000 lbs., has four jets, carries 110 to 150 passengers 600 mph.

—(Boeing Photo.)

AIR REPORT

(Continued from page 48)

earn back their original investment, or more, through sales." The 5-place Courier has a speed range of 30-160 mph., or better than 5 to 1; needs only a 75-yd. strip for the actual landing and take-off; is stall-proof; has a protective steel frame around the cabin and has a 700-mile range. It is the only STOL aircraft in production in the U. S. and features high-lift devices and engine silencing.

ACQUISITION OF AERO DESIGN & ENGINEERING COMPANY, manufacturers of the Aero Commander and Alti-Cruiser, has been completed by Rockwell-Standard Corp., which exchanged 1-5/7ths shares of Rockwell-Standard stock for each share of Aero Design stock, the firm acquiring 99.5 per cent of Aero's 166,600 shares. Based on recent values, the transaction involved about $7,250,000 worth of stock, most of it owned by George T. Pew, who remains as president and vice chairman of Aero Design. Other officials and directors of Aero Design, which will operate as a subsidiary of Rockwell, are Col. W. F. Rockwell, chairman; C. J. Queenan, Rockwell-Standard president; G. C. Shannon, Rockwell-Standard vice president-controller; A. A. Finnell, R-S secretary; W. M. Balliette, R-S treasurer; Ted R. Smith, Aero vice president; Budd Parks, Aero vice president; A. R. Bell, Jr., Philadelphia banker, and E. K. Gaylord, Oklahoma City newspaper publisher. . . .

ROBERT J. (BOB) WHITE, vice president and sales director of Aero Design since September, 1956, died last month after a brief illness. A pilot since 1927, he was in Navy aviation during the war and had been a fixed-base operator and an executive with Philco.

FIRST FLIGHT OF NEW DOUGLAS DC-8 JETLINER was made on May 30 at Long Beach, California, where Douglas Aircraft is building the 600-mph. transport for 17 airlines which have ordered 138 Jetliners. First deliveries to airlines are a year off, being scheduled for mid-1959. DC-8 will carry 118 to 176 passengers.

—(Douglas Photos.)

GREENWICH MEAN TIME is now being used by CAA air traffic control facilities to standardize the time element on a nationwide basis in communications with all aircraft except a civil non-airline aircraft. For the latter, CAA personnel will give GMT first, followed by the local standard time — until all pilots become accustomed to the use of GMT in traffic control. Conversion from local time to GMT is as follows: Add 5 hrs. to Eastern Standard, 6 hrs. to Central Standard, 7 hrs. to Mountain Standard and 8 hrs. to Pacific Standard to obtain GMT.

AIR FORCE IS BUYING CESSNA 310 PARTS FROM COMMERCIAL DEALERS to avoid complexities of carrying parts inventory and save money. Nearest Cessna dealer is supposed to get the parts business for the Air Force's 160 L-27A versions of the 310B.

When you get caught with your "PLANE" down . . .

. . . WE'VE GOT WHAT IT TAKES TO GET YOU OFF THE HOOK

If you find yourself delayed as a result of some electronic, radio or mechanical aircraft problem — the J. D. Reed Company is the firm that will get you off the hook and back into the air in minimum time.

First of all, we are specialists in trouble shooting. For over a quarter of a century we have devoted our full efforts to serving aircraft owners over the nation. We have handled every possible kind of aviation problem and in each case provided our customer with a prompt and economical solution.

Secondly, to expedite the work performed in the J. D. Reed Company shops we have installed the latest equipment and machinery that has been designed for each specific purpose. The right tools . . . in the hands of our factory trained technicians mean a better job in less time. A real savings to you!

Important too, is our large stock of factory authorized parts and accessories — one of the most complete to be found anywhere. Our service and maintenance departments, here again, are able to reduce your "down-time" through the ready availability of the necessary parts and accessories for your job.

It's good business to RELY on REED for all your aircraft service and maintenance requirements.

J.D. REED CO. INC.
SALES SERVICE
Beechcraft
DISTRIBUTOR
MUNICIPAL AIRPORT
HOUSTON, TEXAS
Telephone OLive 4-4351

"L·I·F·E" with LEAR

By BOB MAYS

My job is flying and demonstrating the LEAR L-5/LIFE equipment. This, you will say makes me prejudiced. To this, I agree, because day after day I see many people, including all types of pilots, engineers, etc., who "wring-out" this equipment and come up with nothing but praise.

On my "check-out" flight in a twin aircraft I'd never flown before, using LIFE I'd never seen before, I completed two of the best ILS approaches I've ever made. Next, I made an automatic approach with the L-5 autopilot which was even smoother than the one I had done manually. I especially liked being able to monitor the entire approach on LIFE while the L-5 autopilot did the job.

The L-5/LIFE combination is a great relief to me, especially when I'm flying as a one-man crew. I am free to monitor engine instruments, navigate, communicate, and best of all in this day of heavy traffic density, watch out for other aircraft—greatly decreasing the chance of collision.

The NAFLI ATTITUDE/COMMAND INDICATOR gives me a clear and *natural* presentation of my aircraft's attitude at all times. And in ILS approaches I simply follow its *command* signals for smooth, precise interception of the localizer and glide slope.

The SITUATION DISPLAY INDICATOR pictures my position in relation to the localizer beam, VOR radial or selected track—in the meantime, the L-5 holds my assigned altitude and flies the heading or track I have chosen.

To fly an airway, I merely push two buttons, and I automatically maintain my desired altitude and track. Even my *wind correction* is figured automatically and compensated for me. And the SITUATION INDICATOR shows me my exact crab angle due to cross-wind.

I often fly long hours, and the L-5/LIFE combination allows me to arrive at my destination far less fatigued and therefore mentally alert to approach and land, which is vitally important.

Because of L-5/LIFE's simplicity and reliability, I have lowered my personal minimums considerably—it has taken all the sweat out of low visibility ILS approaches.

Holding patterns, weather and clearances are no longer a three-man job. I receive and transmit clearances while flying a holding pattern by merely turning a knob or pushing a button.

All kinds of people have flown "LIFE"—a 15,000 hour airline captain—private pilots, both IFR and VFR—and their praise was unanimous.

In conclusion, this L-5/LIFE combination is not only wonderful to fly, but a real thrill to demonstrate. As the French say, "C'est la vie"... THIS IS "LIFE"!*

Bob Mays

L·I·F·E

*Lear Integrated Flight Equipment

LEAR NAFLI INDICATOR →

LEAR SITUATION DISPLAY INDICATOR ↓

Write, wire or phone for a demonstration at your home base:

LEAR *L-5/LIFE*
3171 South Bundy Drive
Santa Monica, California

NEW BEECHCRAFT DISTRIBUTOR for the Travel Air and Twin-Bonanza is Syracuse Aircraft Sales of Syracuse, New York, with 48 Upper New York and four Pennsylvania counties for its territory. The firm's principals are T. R. Carpenter, Jr., president; Joseph F. Owens, Jr., vice president-secretary; and Clifford M. Farmer, vice president-treasurer.

BELLANCA CRUISEMASTER DISTRIBUTOR for Washington, Oregon and Idaho is newly-formed Aero-Spray, Inc., of Vancouver and Yakima. Officers are W. M. Lennington, Vancouver, president; L. Allen Perkins, Vancouver, vice president, and Mrs. Gini Richardson, Yakima, secretary-treasurer. The company's flight division is at Richardson Aviation Co., Yakima Municipal Airport.

TRADEWIND AIRPORT, key business flying facility at Amarillo, Texas, has completed an expansion program. Runway 17-35 has been increased to 4,000 ft. in length and has extended approach areas and taxiways, a new 27,000-sq. ft. storage hangar with insulated roof and concrete floor has been added, and hard-surfaced ramp and parking areas have been more than doubled. Shelby M. Kritser is president of the airport company, which makes available new rental cars and fuel, including 100-octane, on a 24-hr. basis.

LOCKHEED JETSTAR last month was flown on a 6,748-mile trip around all four sides of the United States in 17 hrs. 50 mins. Hop started from Edwards Air Force Base, California, at 11:42 p. m., and was via Tacoma, Wash., Chicopee Falls, Mass.; Orlando, Fla., and back to Edwards. "Glove" tanks on each wing increased range to 3,000 miles. Actual flight time was 14 hrs. 50 mins., with less than 3 hrs. for routine refueling and servicing at three stops. Average speed for trip was 456 mph. and highest ground speed was 686 mph. Jetstar is powered by two 9,700-lb. Curtiss-Wright TJ-37's.

DE-ICING WITH COMPRESSED AIR stored in a one-half-cubic-foot fiberglass container is provided by a new B. F. Goodrich Type 23 pneumatic de-icing system for light twins. Displayed at last month's Reading Aviation Awards meeting, system will cost about $3,000 with 3,000-psi. storage unit weighing about 32 lbs. and leading-edge boots weighing about 25 lbs. Bottle at 1,000 psi. is sufficient for about 2 hrs. of flight in icing conditions if cycled every 3 minutes. This can be increased by use of compressed gas. No pumps, oil-separators, timers, solenoids and complicated plumbing will be needed.

A NEW FIN-MOUNTED ROTATING BEACON of silver-coated lamp design, featuring built-in baffle system to eliminate reflections off structural components of the airplane, is now available as factory-installed equipment on Cessna Models 172, 175, 180, 182 and Skylane, and may be purchased from Cessna dealers for

SOUTHWEST AIRMOTIVE OF DALLAS WILL BE CESSNA DISTRIBUTOR as result of its purchase last month of Aircraft Sales Company, Meacham Field, Ft. Worth, which will be a Cessna dealer and authorized service station along with other dealers at Dallas, Longview, Abilene, Wichita Falls and Waco. James Craddock, formerly Humble Oil aviation sales manager, shown second from right above, has joined Southwest to assist in its wholesale aircraft sales. Others in the picture, left to right, are Harlan Ray, Southwest president; G. D. Spear of Cessna and Frank Martin, Cessna marketing manager; Craddock and James E. Lockhart, Jr., Southwest vice president in charge of service.
—(Cessna Photo.)

field installation. It weighs 23 ounces, is visible up to 70 miles, and costs $145 factory installed. Twin-engine Cessna 310B's have a new Grimes rotating beacon shielded to prevent reflection off aircraft surfaces. It costs $150 installed.

NEW PROPELLER CATALOG published by McCauley contains technical information, history of the company and photos showing production and repairing. A second printing is contemplated because of the 38-page catalog's popularity among dealers, according to Sales Manager L. W. Halstead.

NEW NON-MECHANICAL TRANSISTORIZED ELECTRONIC POSITION LIGHT FLASHER, Model AFS-125, is available from P. R. Mallory & Co., Indianapolis. It is smaller than the C-2 flasher it replaces, has indefinite life in contrast to the mechanical flasher's 400-hr. life, weighs less than 1 pound, operates on 28 volts, has no moving parts and no circuit-breaking contacts which could cause failure or radio interference.

A NEW LIFETIME AIRCRAFT COVERING to replace fabric and dope is CAA-approved and marketed under the name of "Eonite" by Eonair, Inc., formerly of Santa Monica, now located at Shafter-Kern County Airport at Bakersfield, California. Eonite is composed of glass filaments, plastics, powdered metal and other materials, which are laminated and chemically thermoset in position on the airframe to produce a strong, taut and lightweight fitted covering with smooth surface. It can be painted, paint can be removed from it, and it can be easily repaired.

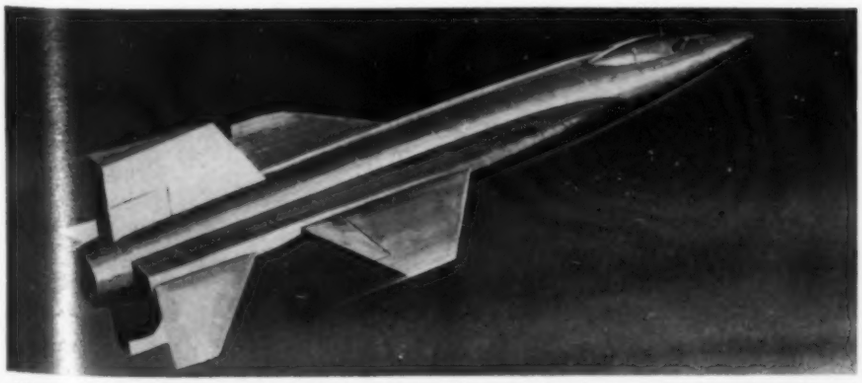
A BRUSHLESS DIRECT-CURRENT GENERATOR has been designed for high-performance aircraft by General Electric. The 100-amp., 30-volt DC generator requires no brushes, eliminates the need for a carbon-pile type of regulator and is cooled by oil circulation rather than blast-air. It features permanent magnet excitation and use of a 3-phase double-way rectifying system to convert the 800-cycle AC current to DC. The new generator was described at the recent American Institute of Electrical Engineers summer meeting and air transport conference at Buffalo, N. Y.

LUND AVIATION (CANADA) LTD., has been named as exclusive sales representative for Canada and George E. Harris & Co., Inc., has been named as exclusive sales representative for the U. S. Midwest by Flight Line Corp., manufacturers of executive, transport and military aircraft seats.

A FLEXIBLE FLAT CABLE COMPOSED OF MULTIPLE CONDUCTORS LYING IN THE SAME PLANE has been introduced by Topp Manufacturing Co. of Los Angeles and is impregnated with silicone compound. It is for use with installations requiring minimum of cable space for multiple connections.

A NEW MINIATURE GAS TURBINE POWER PACKAGE has been developed by Garrett Corporation's AiResearch Manufacturing Division at Phoenix, Arizona, and produces 30 shaft horsepower as a drive for generators, alternators, liquid pumps, freon and air compressors, blowers and other installations. Jack O'Brien, manager, said it is only 16 inches high and 13 inches wide and weighs only 45 lbs. Output shaft speed is available at either 6,000 or 8,000 rpm.

NEW INTERNATIONAL FLIGHT INFORMATION MANUAL, available for 50 cents from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C., provides a world-wide directory of major airports including all airports of entry and the normal foreign requirements for passports, visas, health and customs data. Special flight restrictions and regulations are included. The 112-page manual has information on 146 countries, islands or territories and includes data on money exchange rates, ocean station vessels, U. S. aeronautical telecommunications service and the ICAO.



AMERICA'S FIRST PILOTED ORBITAL AIRCRAFT will be this North American X-15 rocket-powered research plane for the Air Force, Navy and NACA. Its steel skin will glow red from friction heat on re-entering the atmosphere from 200-mile altitudes in outer space.

VOR combined ILS

INDICATOR-COURSE SELECTOR (Model 4087)

✓ LOWEST WEIGHT
✓ LOWEST COST
✓ HIGHEST PERFORMANCE
✓ EASIEST TO READ
✓ MOST COMPLETE
✓ TSO/ARINC SPECS.

IMMEDIATE DELIVERY
Order Now!

See your Lear Dealer, or write for descriptive literature to:
LEARCAL DIVISION, Department ICS-4087,
3171 South Bundy Drive, Santa Monica, California

LEAR LC-51

LATEST BEECH 18 CONVERSION by Bill Conrad of Fort Lauderdale, Florida, has low-drag wing tips which contain VHF antennas for aerodynamic cleanness and better performance. Also note one-piece windshield and 3-blade propellers. Pilot Dave Westfall displayed it at Reading Aviation Service meeting last month, flying 1,140 miles from Ft. Lauderdale to Philadelphia in 5 hrs. 30 mins. on 228 gals. of fuel. He said he indicated 191 mph. at 8,000 ft. using 1,800 rpm. and 26 ins. manifold pressure.

NATIONWIDE ROUNDUP:

New Business In the Hangar

DAYLIGHT FLUORESCENT PAINT markings to make aircraft more conspicuous for lessened collision hazard is being widely adapted by business pilots. Manufacturers of Day-Glo fluorescent paint report that the Air Training Command mid-air collision rate has shown a consistent decline since launching a program of marking approximately 90 per cent of the Flying Training Air Force's aircraft at primary and basic training bases. The markings have to be repainted after 9 to 16 months of exposure, this effectiveness depending upon whether the aircraft are exposed to sunshine in cloudless skies or are operated in areas of considerable cloudiness. Switzer Brothers, Inc., Cleveland, Ohio, manufacturers of Day-Glo, report receiving over 1,000 inquiries from private aircraft owners in the last four months. Information and color swatches of the paint are available from the firm and its aviation supply distributors. Latest boost to use of fluorescent paint markings came when the CAA ordered its 92 aircraft to be marked following a successful experiment with one of its DC-3's. CAA markings will cover about 15 to 20 per cent of the aircraft surfaces with "blaze orange" color bordered in black — wing tips will be painted, upper and lower wing surfaces will receive two wide stripes, entire tail assemblies will be painted, a wide stripe will run along the underside of the fuselage, fuselage sides will carry a full-length stripe and aircraft without radar will have their noses painted. Flourescent paint of various manufacturers will be used to test the lasting quality and reflectivity of the products. The CAA fleet includes 41 Twin Beechcrafts, 36 DC-3's, 5 Convair 440's, 3 DC-4's, 1 C-123, a Grumman Goose, two B-57 jets, two F-80 jets and a T-33 jet.

DALLAS AERO SERVICE, Love Field, Dallas, contracted to paint five CAA DC-3's with Day-Glo for approximately $9,000. Each DC-3 will

Lightplane Computer for Automatic En Route Navigation

AUTOMATIC en route navigation is provided by a new lightweight type ANC-2 electronic computer developed for business planes by Dynavia Engineering Corp., 860 Fabian Way, Palo Alto, California. Its purpose is to feed an aircraft's L-2 Autopilot signals from an omni receiver and stabilized magnetic heading from an ARC Course Director, thus furnishing a continuous control signal to the yaw axis of the autopilot for automatic en route navigation. Using omni signals, the computer locks the autopilot to a VOR radial by steering the airplane on a heading which will precisely track the true center of the beam, inbound or outbound. The aircraft will be automatically flown directly over the station. Switched to the heading mode, the computer furnishes steering signals to the autopilot to lock to a selected magnetic heading which will be flown continuously without resetting the gyro. Thus a precise magnetic track can be selected and flown automatically. Using 14 or 28 volts with a current drain of less than one-half amp., the miniaturized equipment weighs only 4 lbs. including cabling and is priced at $675 plus installation. Dynavia is headed by Bob Haskins, who developed the electric constant speed governor for Bonanzas and the Course Director. He is demonstrating his ANC-2 in a Cessna 310.

Controller

Computer

. . . for certified Beechcraft service

To obtain the best service for your Beechcraft and for prompt attention to maintenance and overhaul requirements, visit the Certified Beechcraft Service Stations listed.

AIRCRAFTSMEN, INC.
Will Rogers Field
Oklahoma City, Oklahoma

ALAMO AVIATION, INC.
Municipal Airport
San Antonio, Texas

ANDERSON AIR ACTIVITIES
General Mitchell Field, Milwaukee, Wisc.

ATLANTIC AVIATION CORP.
- Teterboro Airport
  Teterboro, New Jersey
- Logan International Airport
  East Boston, Massachusetts
- International Airport
  Philadelphia, Pennsylvania
- New Castle County Airport
  Wilmington, Delaware

BUTLER CO., AVIATION DIVISION
Midway Airport, Chicago, Ill.

CURREY SANDERS AIRCRAFT CO., INC.
Downtown Municipal Airport, Shreveport, La.

CUTTER-CARR FLYING SERVICE, INC.
West Mesa Airport, Albuquerque, New Mexico

GRAY AIRCRAFT SVC. CO., INC.
D. A. Cody, Service Manager
Love Field, Dallas, Texas

GREENSBORO-HIGH POINT AIR SERVICE, INC.
Greensboro-High Point Airport
Greensboro, North Carolina

ELLIOTT FLYING SERVICE
Municipal Airport, Davenport, Iowa

THE NORMAN LARSON CO.

PLANESERVICE, INC. (Service Division)
Van Nuys Airport, Van Nuys, Calif.
(Los Angeles Area)

J. D. REED CO., INC.
Municipal Airport, Houston, Texas

ROSCOE TURNER AERONAUTICAL CORP.
Municipal Airport, Indianapolis, Ind.

TEXAS AVIATION CORPORATION
G. K. Roberts, Pounds Field
Tyler, Texas

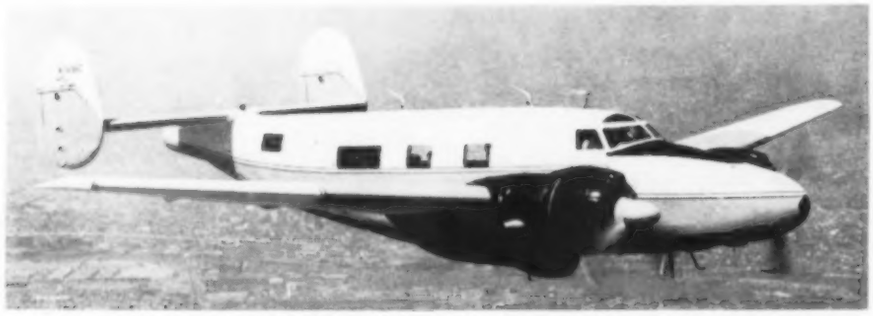
TOPEKA AIRCRAFT SALES & SERVICE
Municipal Airport, Topeka, Kansas

TRADEWIND AIRPORT CORP.
Tradewind Airport, Amarillo, Texas

TULSAIR DISTRIBUTORS, INC.
Hangar 8, Municipal Airport, Tulsa, Oklahoma

UNITED AIRPLANE SALES, INC.
New Municipal Airport
Wichita, Kansas

Put Your BEECHCRAFT in BEECHCRAFT Hands



FIRST FLIGHT PHOTO OF CENTAURUS CONVERSION OF PV-2 shows large windows and streamlined contour of the Oakland Airmotive executive conversion, approved for airline pressurization. With 33,000-lb. gross and useful load of over 14,000 lbs., Centaurus will cruise 280 mph. and has cabin seating for up to 14 passengers. The Oakland, California, firm converted over 100 various multi-engine aircraft for corporate use before it obtained CAA approval for the Centaurus conversion.

NEW NARCO CS-5 CROSS-POINTER INDICATOR provides six-in-one navigation information—omni course, ILS localizer, glide path, to-from, selected and reciprocal course information plus fail-safe flag alarms. It weighs less than 6 lbs., fits 3-in. cutout, is only 2¼ ins. deep, and is priced at $685 including VOA-3 omni converter and shockmount.

receive a total of three coats — first a primer of white preparakote, then application of Day-Glo and finally a finish coat of clear Filteray. Day-Glo stripes on these jobs are 30 ins. wide. . . . Other Dallas Aero work last month included: Sinclair Oil's third Lodestar to receive the DAS speed-safety-stability modification was delivered. . . . Bill Edwards, chief pilot, has brought in Cosden Petroleum's 4-engine de Havilland Heron for modification and installation of generators, repaint, radio installation and relicense. . . . Art Dareis' Champion Oil Lodestar had its tanks resealed. . . . Metal canopy was installed on Ralph Cobb's Glasscock Drilling Dove. . . . Hartzell propellers went on Speed Johnson's Bob LeSage Beech 18. . . . Five DC-3 periodic checks a week were performed for Central Airlines. . . . Bob Morgan brought his Mene Grande Oil Aero Commander in from Barcelona, Venezuela, for a double engine change and 100-hour. . . . Annuals were performed for Art Floyd's Otis Pressure Lodestar and L. P. Meyers' Temco Aircraft Lodestar. . . . Gene Bailey, DAS general manager, has named Roy T. O'Haver, Jr., formerly with Curtiss-Wright, Slick and Howard Aero Service, as a service representative.

EXECUTIVE AIRCRAFT SERVICE, Redbird Airport, Dallas, has delivered Mene Grande Oil's complete new DC-3 conversion to Chief Pilot Red Irwin, in from Barcelona, Venezuela. This airplane has many new features, including the first DC-3 installed hydraulically-operated sliding picture windows for the cockpit sides, these windows measuring about 40 ins. by 17 ins. Center section was modified to install bays for all radio and electronic equipment and for cargo in the space formerly occupied by fuel tanks, with outer wing panel tanks providing total of 1,200 gals. Complete Maximizer installation was made, along with a new EAS hydraulic system, new 12-place interior with berthable chairs, all new electrical system and Collins AP-101 autopilot. Associated Radio installed complete new radio equipment and RCA radar. . . . Two "firsts" in Convair 340-440 conversions were installed in Col. E. W. Estelle's Esso Shipping Convair — the first Jatos and the first triple windows. Permanent Jato was installed in the nacelles, a 1,000-lb.-thrust unit in each, and provision was made for two externally-mounted Jatos under the belly when needed for operations from airports at extremely high elevation. Double engine change was also made. . . . Herb Hansen's Atlantic Refining DC-3 got a new EAS hydraulic system, new electrical system, double engine change and 1,000-hr. inspection. . . . Russell Purchase had a Dow Chemical DC-3 in for aileron gap closure and inspection. . . . Cotton Jeter's United Gas Lodestar received a double engine change and annual. . . . Two Sid Richardson DC-3's were in for 100-hr. inspections.

CAA ENGINEERS MADE FIRST MOVE IN CERTIFICATION OF LOCKHEED JETSTAR by enjoying a familiarization hop. Clockwise, they are W. H. Messick, J. D. Ludwig, R. J. Auburn, R. Allen, C. F. Biesemsier, H. H. Slaughter, F. T. Melton, L. C. Senker and E. J. Rudder. All are from CAA-Ft. Worth, except Auburn and Allen, who are from CAA-Washington.

—(Lockheed Photo.)

L. B. SMITH AIRCRAFT CORPORATION, Miami International Airport, has been designated by Vickers Armstrong, Ltd., to handle repair, conversion and modification of 4-engine propjet Vickers Viscount transports. Vickers will supply a fuselage repair jig which will be mounted as a permanent fixture in the LBS hangar.

REMMERT-WERNER, Lambert Field, St. Louis, installed a new interior in Ron Breckenridge's Chemstrand Twin Beech during a 1,000-hr. inspection and overhaul. . . . Aileron gap strip was installed on the Peabody Coal Super-92 DC-3 while it was in the new "wrap-around" shop for 1-day 100-hr. inspection. Bob Boyanovsky and Bill Frame are the pilots. . . . Heckett Engineering's Super-92 DC-3 was in for wing removal and overhaul and 100-hr. inspection.

SOUTHWEST AIRMOTIVE, Love Field, Dallas, installed a new interior in Stormy Rodereick's T. D. Humphrey and Sons' Beech 18 while it was in for double engine change and major re-work. . . . Anderson Dunham's new Lodestar received a double engine

change, paint trim and miscellaneous work. Charles Viosca and Hollis McAdams are the pilots. . . . Also in the shop where John Pancallo's Pauley Pan American Oil Beech 18, Magnolia Petroleum's Beech 18, Tom Smith's Shamrock Oil Beech 18, Kennie Buis' Forest Oil Beech 18, Jinks Farnall Western Drilling Beech 18, Cotton Jeter's Union Producing Beech 18, Larry Montigny's Dresser Industries Lockheed PV-1, Sam Willis' Magnolia Petroleum DC-3, the Corps of Engineers DC-3 flown by Jim Smedley and Ray Warren, Cummins Engine's DC-3 (Bill Pruner and Phil Kaufeld), Virgil Head's Ideco Aero Commander and Ralph Hall's Texaco Cessna 310.

PACAERO ENGINEERING CORPORATION, Santa Monica Airport, is converting a British American Oil Lodestar into a Learstar Mark 1A, which will be Chief Pilot Jack McVicar's second Learstar. . . . Clyde Martin brought in Potlatch Forests' Lodestar for conversion into a Learstar Mark II. . . . Miscellaneous work was performed on Learstars for Solo Cup Company, Jim Hickerson of Plymouth Oil, Doug Garneau of Utah Construction, Al Franks (Mr. C. B. Wrightsman) and Vic Voit of Bechtel Corp.

HORTON & HORTON CUSTOM WORKS, Meacham Field, Ft. Worth, received a Widgeon and a Martin B-26 simultaneously from Tony Zuma of Tennessee Gas Transmission for interiors in keeping with Zuma's fleet styling — headlining, sidewalls and bulkheads of cleanable textured vinyl high pointed with gold trim. . . . Paul Weber's New Mexico Timber Beech 18 received a new interior with turquoise, off-white and cocoa colors and featuring a couch with four removable armrests, storage door and ice chest. . . . Interior styling is being developed for 1959 models of the Bell Model 47J Ranger helicopter. . . . Mrs. Forest Dorn's Lodestar from Bradford, Pa., is the third Forest Oil plane with an H & H custom interior, Chief Pilot Ray Johnson supervising the modifications and installation.

AERO CORPORATION OF ATLANTA, Municipal Airport, Atlanta, has W. A. Miller's Mississippi Power & Light Beech 18 in for RCA radar and electronics installations, new interior, air stair, stability modification and cabin modifications including moving of rear bulkhead and installation of accordion bulkhead up front. . . . Miscellaneous repairs were performed for Paul Duncan's Green Construction Super Ventura, Oaktown, Indiana. . . . The William T. Burden Industries Beech 18 from Sulphur, La., was in for 1,000-hr. check. . . . New military programs include manufacturing of helicopter slings, overhaul of H-19 helicopter assemblies, overhaul of H-19 gear boxes and overhaul of H-34 main rotors. . . . Aero has completed overhauling a batch of over 370 helicopter engines.

AIRESEARCH AVIATION SERVICE Division of the Garrett Corp., Los Angeles International Airport,

BUT WHO READS SIGNS? The little warning sign at American Airlines stewardess college between Ft. Worth and Dallas; notwithstanding, sunbathing is a favorite past-time for both the girls and helicopter pilots from nearby Bell Helicopter Corp. —(Bell Photo.)

the PAGAN by Cair

Cair's outstanding new PAGAN modernization is a *total* conversion . . . offering all the proven performance, safety and comfort features that transform the popular D-18 into one of the finest executive transports available today. 3-blade propellers, power plant improvements, wing fuel tanks, modern wing tips, air-step door, spacious new interior, and a host of other advanced features for dependable, economical business flying.

It can be purchased as a complete, fully-equipped aircraft . . . in fully-approved kit form . . . or the PAGAN conversion can be applied at Cair to your present D-18 airframe.

GET THE COMPLETE PAGAN STORY—Write for free copy of 8-page illustrated PAGAN brochure.

Cair

1657A

CHAMBERLAIN AVIATION, INC.

Akron Municipal Airport • Akron 6, Ohio

HERE'S WHY YOU SHOULD HAVE A NEW

Scott TAIL WHEEL

Are you missing the comfort, economy and safety of the proper tail wheel for your aircraft? You will be agreeably surprised to find how much more over-the-nose visibility you can have, how soft and quietly your ship will taxi with a new Scott Tail Wheel.

Scott tail wheel assemblies insure quiet, smooth easy taxiing and landings even on rutty fields. They reduce aircraft maintenance cost and tail spring breakage. Scott tail wheels cost a little more, but you are quickly repaid in low, low maintenance cost.

If your present Scott tail wheel is still in good condition, perhaps a few replacement parts are all you need to obtain like-new performance.

MODEL 3200

Smooth balloon tire action, extra floatation ideal for soft ground. Automatic, Steerable and Full-Swivel Tail Wheel Assembly with 8" pneumatic tire. Fits Piper Models 18, 19, 20; Stinson 100, 101, 102, 103, 108; Cessna 120, 140, 170; Aeronca 15AC, 515AC; Luscombe 11A; Globe, Temco Swift and many others.

MODEL 3-24-B

Automatic, Steerable and Full Swivel Tail Wheel Assembly with 6" solid tire. Fits Luscombe 8; Piper J-3, J-4; Taylorcraft L-2; Aeronca L-3B, Champion and Chief 7AC, 11AC; Stinson 10, HW-75 and others using 1½" or 1¼" leaf spring.

Scott also manufactures other aviation products including oxygen systems for light business aircraft.

Order from your Scott Dealer.

SINCE 1937 Scott FOR SAFETY - FOR SERVICE

SCOTT AVIATION CORP.

235 ERIE STREET • LANCASTER, N. Y.

Export: Southern Oxygen Co., 250 W. 57th St., New York 19, N. Y.

has completed a newly-designed executive interior for International Business Machine's Convair 340B. It included a high fidelity stereophonic tape reproduction sound kit, IBM Dictaphone transcriber and recorder and IBM electric typewriters. Also installed were auxiliary wing fuel tanks, an auxiliary power unit and Convair speed-sound kit. Extensive radio modification work was done and new exterior paint job performed. Flight Operations Manager Chuck McKinnon and Chief Pilot John Powers brought in the aircraft. . . . Consolidated Coal's B-23, piloted by Lou Ramey and Andy Soska, was in from Pittsburgh for 100-hr. inspection, annual relicense, inspection and repair of center section fuel tanks and long-range wing tanks, recovering of all control surfaces, landing gear overhaul, installation of short stacks, extensive radio modification, new headliner and other interior refinements and new paint job. . . . Pete Collings' Republic Aviation DC-3 received complete radio and electrical rewiring, extensive radio modification work, edge-lighted panels, 200-amp generators, squared wingtip kit and engine fire detection system in addition to RCA radar and new interior. . . . General Electric had electrically-operated folding stairs fabricated for installation on a Constellation-type aircraft.

PIEDMONT AVIATION, Winston-Salem, North Carolina, delivered Bell Aircraft's DC-3, William Powell, pilot, with rewired electrical and radio system, new interior and picture windows, reworked fuel tanks and 4,000-hr. inspection. . . . Steve Richards' Magnavox Corporation DC-3 has new elevators and ailerons installed. . . . C. W. Von Holland's Union Bag DC-3 had its landing gear overhauled. . . . Miscellaneous repairs were performed on the Diamond Alkali DC-3, Roy Black, chief pilot and Hank Synamek, maintenance chief. . . . Owen Mayfield exchanged both wings on his Hercules Powder DC-3. . . . Herb Drew was in with the R. J. Reynolds DC-3 for a generator system rewiring. . . . Nelson Rooker, chief pilot, brought in Proctor and Gamble's DC-3 for new interior, new exterior paint including Day-Glo, radome modification, 4,000-hr. inspection and miscellaneous work. . . . Miscellaneous work was performed during the month for the following: Hap Wilson's two Management Service DC-3's, Bob Amundsen's Pocahontas Fuel Beech 18, George Seay's Hennis Freight Beech Super 18, Karl Styne's Noland Company Lodestar, Buck Teague's Pilot Freight Carriers Beech 18, Virginia State Police Piper PA-22 and Lloyd Harris' Lockheed Aircraft Lodestar. . . . Miami Airlines' DC-4 and Bob Renecker's Nationwide Transport DC-3.

ADDISON AIRPORT, Dallas, conducted ceremonies last month in which the nation's first privately-owned and operated terminal omni (TVOR) was

TAIL STINGER FOR AIR SURVEY identifies this Aero Commander Super 680 leased from Commander Aviation, Ltd., Gananoque, Ontario, by Spartan Air Services of Ottawa, who modified and equipped it with magnetometer survey and Decca navigating devices. Spartan crews will fly it over 700 hours this summer mapping 110,000 line miles of New Brunswick and Nova Scotia geological territory for the Department of Mines and Technical Surveys.
—(Spartan Air Services Photo.)

activated by the CAA, with Regional Administrator L. C. Elliott doing the honors. . . . Located on the airport, which is a privately-owned business-flying center, the TVOR is a $15,000 Collins Radio unit and will be operated through the voice facilities of the Dallas Approach Center at Love Field, about 8 miles away.

NARCO HAS DISCONTINUED THE VTP-10 STRAIGHT WHIP ANTENNA and replaced it with the VTP-17 bent-whip antenna. Most ground radio facilities now have circularly or horizontally-polarized signals and the bent whip provides better reception.

PORTABLE RADIO DIRECTION FINDER for small aircraft and boats has been developed by Coven Music Corporation's Allen and Bradford division, Chicago. Called the DF-O-MAT Navigator, it weighs 6 lbs., is 7 ins. high, 8.5 ins. wide and 6 ins. deep. Price is $149.95.

These Aircraft Engine Experts are AT YOUR SERVICE

Continental's Factory Re-manufacture plan, successor to the periodic overhaul, backs you with the specialized skills of the men who know your engine best. With your factory re-manufactured Continental, you get new engine warranty—new log book with zero hours—at a modest, pre-determined price. Most important of all, you're back in the air with an absolute minimum of costly down time.

WHY NOT WRITE NOW FOR THE INFORMATION THAT CAN SAVE YOU TIME AND MONEY WHEN OVERHAUL TIME ROLLS ROUND AGAIN?

WHEN CHOOSING AN AIRPLANE, FOR PERSONAL OR BUSINESS USE, MAKE SURE IT HAS CONTINENTAL ENGINE . . . PILOTS' UNDISPUTED FIRST CHOICE.

Continental Motors Corporation

AIRCRAFT ENGINE DIVISION
MUSKEGON, MICHIGAN

THE 100TH 4-PLACE, 200-MPH. BEECH TRAVEL AIR has been delivered *to Boston and Atlantic Aviation's territory there, with O. George Tobey taking delivery. Called the quietest twin on the market and powered by two 180-hp. Lycomings, the Travel Air had been in full production only five months when No. 100 was delivered.* —(Beech Photo.)

FIFTY DAYS ALOFT in Cessna 172 powered by 145-hp. Continental using Gulf Oil fuel and lubricants with Wynn's Friction Proofing is goal of Dallas Pilots Skip Fletcher (left) and Lee Arthur. Record is 1,124 hrs.

THE LEARSTAR STORY

(Continued from page 23)

R-1820-76A rated at 1425 horsepower for take-off and 1275 hp METO. New engine mounts incorporate the latest dynafocal shock absorbers and the design of the engine mounts moves the engines three inches outboard to reduce vibration induced by the propeller tips into the fuselage structure. A modern cowl shape has been developed and cowl flaps for controlling engine temperatures in all ambient temperature conditions are incorporated. Siamese jet type exhaust stacks are employed to reduce back pressure and to increase airplane performance and cooling air augmentation.

A completely new carburetor induction system has been designed with under-cowl cooled air inlet for prevention of ice formation on the inlet lips. The oil cooling system consists of a large elliptical cooler with a highly efficient expansion type air inlet and a controlable exit flap. Firewall shut-off valves are provided for all systems using inflammable fluid. The entire power plant installation was designed to meet the most modern fire prevention, detection and extinguishing requirements.

Automatic propeller feathering in-

PROTECT
YOUR AIRCRAFT
WITH THE BEST!

* These Aircraft Cleaners and Polishes MUST be tops or they couldn't carry Air Associates Name.

AIR ASSOCIATES
A Division of Electronic Communications, Inc.

Atlanta, Ga.; Chicago, Ill.; Dallas, Tex.; Glendale, Calif. Miami, Fla.; San Francisco, Calif.; and Teterboro, N.J.

ALUMINUM POLISH Cleans and polishes unpainted aluminum-clad surfaces in one operation. Non-inflammable, Non-toxic, Non-corrosive to aircraft metals. Will not damage Plexiglas or painted surfaces that are polish-spattered during the cleaning operation.
$2 QT. $4.95 GAL.

WINDSHIELD CLEANER ... Non-crazing, Anti-static and Non-inflammable. Especially formulated to clean and polish Plexiglas, Lucite or Sierracin windshields, windows, canopies, helicopter domes or other transparent plastic surfaces. Easily removes service haze, oil spatter, bug and water marks.
$1 PT. $1.60 QT.

DEVELOPED expressly for airplanes and sold only through aviation supply houses. Contact your nearest AIR ASSOCIATES Dealer.

SILICONE GLAZE ... Cleans, waxes and protects. Formulated for use on lacquered, enameled and doped fabric finishes. Easily applied and removed. Gives long-lasting protection from service soils, sun, rain. Essential for aircraft not normally kept in hangars.
$2 PT. $8.00 GAL.

SPEED-GLO POLISH Cleans and polishes all lacquered, enameled or doped fabric aircraft finishes in one easy operation. Formulated to quickly remove service soils and oxidized paint pigments with a minimum of effort and to produce hard, dry, lustrous finish.
$1 PT. $4.50 GAL.

COMPRESSED AIR-TIP DRIVEN ROTORS power this new Army K-17 experimental copter developed by Kaman Aircraft Corp. at Bloomfield, Conn., with 400-hp. Blackburn Turmo gas turbine driving a Boeing compressor. Air expelled from tip nozzles drives the rotor, eleminating need for transmission and clutch. Tail rotor is used for steering only, is fixed-pitch propeller driven by hydraulic pump. Prop is shown stationary, reverses direction for steering thrust.

corporates components such as feathering switches and time delay mechanisms that are identical to those used by the big transport aircraft, the only difference being in the method of sensing power failure. At the time Gordon Israel designed the system, engine torque noses were not available so in lieu of the torque nose they sense power failure by a torque shaft connected to the accessory section of the engine and extending aft through the firewall to the microswitch. This complete power failure sensing system was test-cycled ten million times on a bench without failure. Since originating the system, there has never been a recorded case where the propeller did not automatically feather in case of power failure.

It is readily obvious there have been no compromises in PacAero's engine installations, no attempt to save or cut corners or salvage old parts. They are finely engineered all the way through and the performance gained, especially from reduction of cooling drag, is proof thereof.

THE RIGHT START . . .
. . . BEGINS WITH
MATTITUCK

AIRFRAME SPECIALISTS
MAINTENANCE OVERHAUL
RECONSTRUCTION
MODIFICATION CONVERSION

MATTITUCK AIRBASE CORP.
LINDEN AIRPORT, LINDEN, NEW JERSEY WAbash 5-0533

FLY
CENTRAL
AIRLINES

. . . to over 30 cities in six states with connections to cities throughout the nation.

Anywhere you go in Texas, Oklahoma, Arkansas, Kansas, Colorado and Missouri, Central Airlines will be happy to help you bank your time for future use.

You will earn extra dividends in pleasure and economy when you use Central Airlines' FAMILY PLAN . . . the whole family can fly with you . . . at reasonable cost Monday noon through Thursday noon.

For confirmed reservations call:

CENTRAL AIRLINES

OKLAHOMA • TEXAS • ARKANSAS
KANSAS • MISSOURI • COLORADO

Complete Audio Power System Takes Up No More Space than the Speaker Alone...

DARE DAS-1

10-WATT TRANSISTORIZED AMPLIFYING SPEAKER

Specifically Designed for Aircraft Use

COMPACT . . .
Takes up no more room than a 5-inch speaker alone.

LIGHTWEIGHT . . .
22 ounces, including speaker. Requires no shockmount.

POWERFUL . . .
Provides a full 10-watts of power from as little as 16-milliwatt input.

VERSATILE . . .
Works from any 500-600 ohm source.

QUALITY . . .
Total harmonic distortion less than 2% at 2 to 3 watts; less than 7½ % at full 10-watt output.

LOW CURRENT DRAIN . . .
Draws only 1.2 amps for full output at 14 volts; or 0.6 amps at 28 volts.

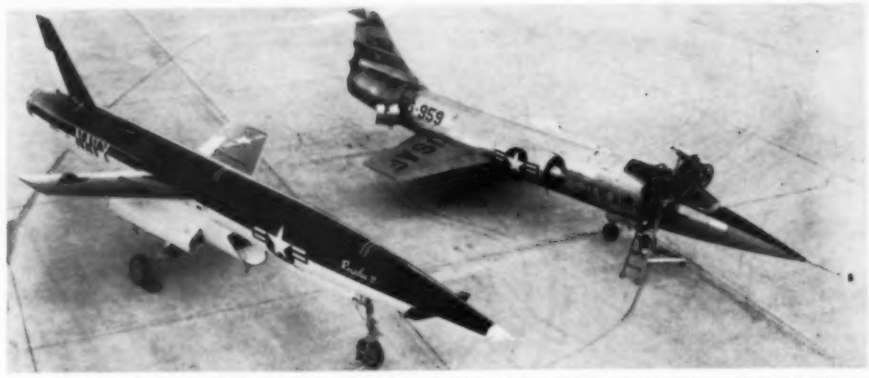
COMPLETE . . .
Includes amplifier, speaker, mating AN connector, fuse and fuse-holder.

EASILY INSTALLED . . .
Directly replaces 5-inch speaker. With special adapter plate will easily replace 6-inch speaker.

See it today at your Dare Distributor or write

DARE INC.
TROY, OHIO

Manufacturers of world-famous DARE aircraft communications and navigation equipment



SIMILAR APPEARANCE OF MANNED AND UNMANNED MISSILES is shown in this General Electric photo of a Chance Vought Navy Regulus 2 (left) and a Lockheed Air Force F-104 fighter at Edwards Air Force Base. Both have General Electric J-79 engine in 15,000-lb. thrust class for Mach 2 speeds.

Likewise the structural integrity of the airplane is beyond dispute. Every portion of the basic structure has been thoroughly tested and flight measurements of stresses in the most highly loaded portions of the airplane were made during abrupt pull-ups and in high speed spirals up to the limit strength of the airplane. Due to the use of 24ST, with a much higher ratio of fatigue strength to ultimate strength than some of the more modern alloys, the airplane is capable of withstanding an infinite number of 30-feet-per-second gusts.

Special equipment items available for the Mark I Learstar include wing root fillets that give a slighly lower stall speed, a slight increase in cruise speed and a noticeable reduction of cabin sound level; shock mounted vibration panels in the plane of the propellers on each side of the fuselage; a cargo door and floor for quick-change from executive transport to cargo carrier (as provided for the original Chance Vought airplane).

A Mark II Learstar was brought out to meet the needs of the Lodestar owner who had a good low time airplane with a satisfactory interior, radio, instrumentation, etc. The Mark II

The Propeller Story for '58 . . .

McCauley's out front!

. . . Lighter! Faster! Smoother!

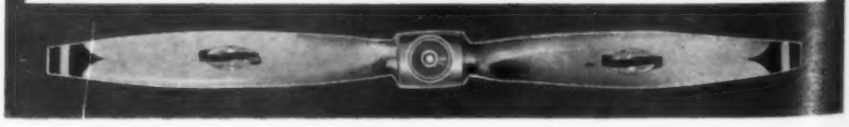
There's a good reason why McCauley propellers are the first choice of so many pilots who'll fly only the best.

New McCauleys—both fixed-pitch and constant-speed—are delivering *more* of what discriminating pilots want from a propeller. Here you see a McCauley Met-L-Matic on the nose of the handsome Piper Comanche. McCauley was specified for this application because it's *lighter*, produces *smoother* engine action and *faster* take-off, climb and cruise.

McCauley propellers are light, yet plenty rugged! With a McCauley you can forget your propeller worries for the life of your plane. It's no wonder that McCauley is the industry's leading supplier of metal propellers for personal and business aircraft. They are available throughout the world.

Specify McCauley!

McCAULEY Industrial Corporation • 1840 Howell Ave. • Dayton 17, Ohio, AMherst 3-3541



PORTABLE RADIO NAVIGATOR for standby use has to vertically-polarized ferrite plate-type antennas for sharp null characteristic of direction finder and a switch to eliminate automatic volume control for build and fade orientation. Azimuth scale gives relative bearing. Marketed by Zenith Radio for $99.95, it is an all-transistor portable weighing less than 4 lbs. including batteries and receives standard broadcasts, 150-400-kc. CAA weather-navigation stations and marine beacons.

incorporates all the aerodynamic improvements of the Mark I and externally is identical to the Mark I except for the sliding windshield. Take-off gross weight of this airplane is 22,500 pounds with landing weight of 20,400. The engines are Wright R-1820-56A rated at 1350 hp. for take-off and 1200 hp. METO.

PacAero also does a lot of partial Lodestar modifications approved under their supplemental type certificates. These include the rudder spring tabs, Goodyear single-disc brakes and rudder spring tabs (for Lodestars equipped with 1820-56A engines), bat wing removal, elimination of the flap drag extensions, elevator spring tabs and stabilizer angle change. These modifications result in substantial increase in cruise speed and provide longitudinal stability meeting the current CAA standards.

We learned from Gordon Israel that during the original CAA certification tests they conducted more than thirty actual take-offs at take-off gross weight and accelerate to V/MC on two engines, jab the left engine to idle cut-off, accelerate to V-2 speed and climb out with no strain.

PacAero President Vern Benfer, who accompanied us on the flight to San Francisco, reported that their $5,600,000 in sales during 1957 represented a twenty per cent increase over 1956 business. With 75,000 square feet of floor space on six and one-half acres of ramp and parking space the company is well situated on Clover Field. They also have facilities at Chino to take care of any jobs too big for the Santa Monica operation. Benfer, who came to PacAero with the Learstar when Lear sold out to this wholly-owned subsidiary of Pacific Airmotive, is working hard to broaden the base of his organization's operations. "We don't want to be primarily dependent on any one proprietary item or any one model of airplane. That's why more than ten percent of our employees are engineers partially engaged in research and devlopment," Benfer told us. But the steady pace of Lodestars being turned into Learstars as more and more companies discover the performance, safety and comfort features at a price they can afford attests to the fact that the Learstar business is going to be good for a long time to come.

In 1670, Francesco de Lana devised a flying machine which looked like the illustration. The principle of copper spheres, made lighter than air by vacuum, was sound but impossible of construction in size and thinness to withstand external air pressure.

SOUND INSURANCE

Insurance is bought for the future. Therefore, its security is determined by financial soundness and prompt service whenever and wherever needed.

The United States Aircraft Insurance Group, organized in 1928 to pioneer "aviation insurance," has served the aviation market continually for over thirty years.

Its present 60 member companies with combined multi-billion dollar assets is assurance of financial strength. Its 30 year record of prompt claim and loss adjustments is assurance of service when needed.

Be sure you have "U. S. Group" protection. Coverage is conveniently arranged through your own agent or broker.

UNITED STATES AVIATION UNDERWRITERS
INCORPORATED
80 JOHN ST. • NEW YORK 38, N. Y.

Yes - "PRECISION" has
A FULL HOUSE
Everything from the Firewall Forward

Aircraft Engines
Aircraft Propellers
Aircraft Accessories
Kustomer Sales
Kustomer Service

Precision Aeromotive Corporation
International Airport Houston, Texas Phone Mission 5-4636

Specializing in Radio Overhaul, Service and Parts
. . . When TIME is IMPORTANT . . . and
DEPENDABILITY ESSENTIAL . . .

FLORIDA AIRCRAFT RADIO & MARINE, INC.

★ New and Surplus Equipment . . . Large Stock of Spare and Replacement Parts
★ State Dept. Export-Import Permit No. 3108
★ CAA Approved Repair Station No. 3653. Class 1 and 2, Class 3 Limited

Florida Aircraft Radio & Marine, Inc.
5365 N. W. 36th Street, Miami Springs, Florida
Phone TUxedo 8-4614 Wm. C. Rogers, President

TEN YEARS OF AVIATION ADVANCEMENT
TAA
TUCSON AIRPORT AUTHORITY
OCTOBER 18-19, 1958

WHAT ?? WHERE HOW MUCH $

IFR HOOD

First in Safety! First in Comfort!
First in Pilot's Choice
The modern method of simulated instrument flight for training and maintaining proficiency.
$15.00 at your Airport or
FRANCIS AVIATION
Box 299 Lansing, Michigan

Aero Commanders and Apaches
for Lease
Short and Long Term
All Types of Leases
Hertz RENT A PLANE Licencee
for South Florida
Leases - Charter - Sales - Broker
Du Pont Air Interests
Box 923 IAB, Miami 48, Florida
TUxedo 7-9441

SUPER WIDGEONS
6-Place . . . Completely equipped.
GRUMMAN GOOSE
Executive . . . Zero SOH.
GRUMMAN MALLARD
630 Hours TT . . . 130 Hours SOH Airframe and engines.
TWIN BEECH SUPER 18
Zero SOH Airframe and engines.
AERO COMMANDER 560E
1957 7-Place . . . 125 Hours TT.
WELSCH AVIATION CO.
60 E. 42nd St. NEW YORK 17, N. Y.
MUrrayhill 7-5884

We Want To Buy Two
Hydromatic D18S
Will be overhauled and rebuilt to special configuration, with speed kits, new type interior, etc. Must be low cost, needing overhaul. Give all details in first letter.
Remmert-Werner, Inc.
Lambert Field, St. Louis, Missouri

OXYGEN EQUIPMENT
SALES & SERVICE
REGULATORS—MASKS—VALVES
PORTABLES & CYLINDERS
FIXED INSTALLATIONS
GOVT. APPROVED REPAIR STATION
ZEP AERO Phone: ORegon 8-1161
EL SEGUNDO, CALIFORNIA

We Buy Used Aircraft
Light Twins or Larger
for resale or rework as
executive aircraft
Give all details in first letter
Remmert-Werner, Inc.
Lambert Field, St. Louis, Missouri

Immediate Delivery
We stock, overhaul, and install
PRATT & WHITNEY R1830 —75, —92, —94 R985
WRIGHT R1820 —202, —56, —72 R1340
Lycoming — Continental
and our most popular DC-3 engine
Super-92
ENGINE WORKS
Lambert Field INC. St. Louis, Mo.

Pompano Beach Airport
Quickest, Easiest Access to
all points between Palm Beach-Miami
Complete Business Aircraft Services
No Landing Fees 24 Hr. Line Service
No Traffic 80-91-100 Octane
One 4650'x150' hard surface runway (14-32)
Three 4000'x150' hard surface runways
122.8 Unicom — Night Lighted

On the Airport	Next to Airport
Golf—18 hole course	Excellent accommodations
Clubhouse, lounge	Hillsboro Lighthouse
Restaurant	Deep sea fishing
Swimming Pool	Yacht Basins
Showers and lockers	Ocean Beaches
Car rental	Amphibian charter

50 beautiful mechanics
All facilities for
airframe, engine, radio, electronic
maintenance, conversion, overhaul
by
Remmert-Werner
of Florida, Inc.

CAA APPROVED
NON-BREAKABLE
SPARK PLUG TERMINAL SLEEVES
FOR THREADED OR STANDARD LEADS
J. E. MENAUGH COMPANY
4555 BROADWAY CHICAGO 40, ILL.

THE PLACE TO STOP
RALEIGH-DURHAM
N. C.

FLY TO MARTHA'S VINEYARD ISLAND
for a day, week, or season
AIRPORT — 3 hard surface runways; Class-3 Field landing facilities, hangarage, maintenance; commercial airline service.
VACATION playground. Beaches, swimming, all outdoor sports, quaint towns and villages, ideal living accommodations.
Martha's Vineyard Information — FI
MARTHA'S VINEYARD CHAMBER OF COMMERCE
Vineyard Haven, Mass.

THE PLACE TO STOP
IN MINNESOTA
Otis Lodge
Luxury in the wilderness on a blue water lake with walleyes, northern, bass and pan fish. Beautiful 9-hole golf course. On your Duluth sectional. 80 and 91 octane, hangar, beacon, Unicom 122.8, Hertz cars. Write for brochure. Mr. and Mrs. Arthur R. Otis, Grand Rapids, Minnesota.

NAVCO Inc.
Lambert Field
St. Louis, Mo.
PErshing 1-1710
$1,000,000 in Active Parts for Executive Aircraft

Douglas	Airframe Parts	Pratt & Whitney
Beechcraft	Engine Parts	Continental
Lockheed	Standard Parts	Wright
A.R.C.	Sperry	Accessories
Bendix	R.C.A.	Instruments
Collins	Wilcox	De-icers, Tires

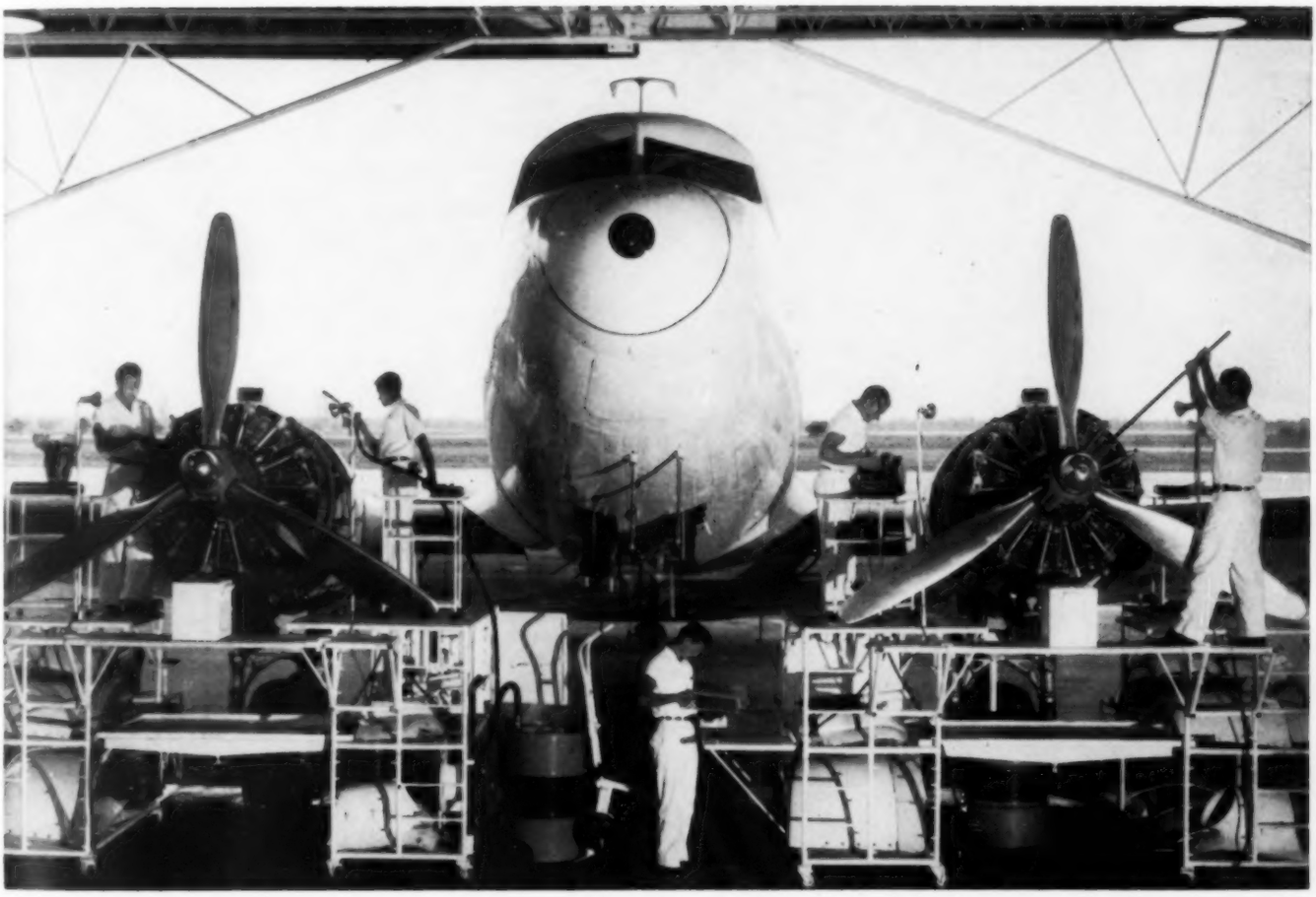
AIREX Service

WE BUY TWINS
CASH NOT CONVERSATION
THERE IS A DIFFERENCE!
One or complete dealer stocks, new or used. We'll buy over the phone. No Red Tape. We pick up. Send for our free list of buys.
VEST AIRCRAFT CO.
Box 5306
EM 6-2663 Denver, Colo.

Now — for your DC3

100 hour inspection in 1 day for $289 plus parts and any repairs authorized by you

in **REMMERT-WERNER's** exclusive new **Wrap Around Shop**



Here is a completely new inspection tool and system, especially designed from time-motion studies and our experience of over 3,000 inspections and twelve years of concentrated DC3-C47 work to cut costs 25% or more. It brings power, supplies, tools, and all other necessary shop facilities directly to your airplane, reducing mechanics' time away from the job. Special equipment speeds lubrication with clean, correct greases. A "floating stockroom" with all normal repair parts can be moved directly to the job for immediate physical availability. New inspection forms and procedures coordinate manufacturer's recommendations, AD Notes, and other requirements.

Try a 100 hour inspection in our Wrap Around Shop and see for yourself how much time and money you can save. Ask also about our DC3 Maintenance Contracts, which can lower your costs to as little as some light twins. Write or call today for an appointment at your convenience at any of our locations.

Executive Aircraft for Immediate Delivery

Grumman Goose — New three bladed full feathering props, all metal wing, fresh overhaul on airframe and engines. New executive interior, new exterior paint. $69,500.

Deluxe Super-92 DC3 — Just converted with fresh overhaul on airframe and engines. Beautiful interior, large picture windows, Collins and Bendix radio, lightweight landing gear doors.

Remmert-Werner

Inc. of **St. Louis** Lambert Field

Inc. of **Florida** Pompano Beach

Inc. of **Toledo** Express Airport

THOMPSON AND TEXACO

—teamed up for 30 years to give the best service and the finest products

TEXACO HONORS ONE OF ITS OLDEST DEALERS with this plaque and a gold watch. Carl Hellberg, Thompson Flying Service General Manager (left) is shown accepting this plaque from E. C. Treseder, Texaco Representative, Butte Division.

Thompson Flying Service, Salt Lake City, Utah, has sold Texaco aviation products enthusiastically for 30 years. It's one of the oldest Texaco dealerships in the country, founded by "Tommy" Thompson, one of aviation's pioneer flyers. A record like this is based on a lot of satisfied customers—people who appreciate Thompson's thorough service, and the dependable performance they get with Texaco fuels and lubricants in their aircraft.

Thompson Flying Service chose Texaco because they know airplanes and flying—and that Texaco products are the best way to keep ahead of the increasing demands of modern equipment. Texaco quality is so well known in the aviation industry, in fact, that *during the last 23 years, more scheduled revenue airline miles in the U. S. have been flown with Texaco Aircraft Engine Oil than with all other brands combined.*

Your Texaco Aviation Representative will be glad to explain the many advantages of handling Texaco Aviation products. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write The Texas Company, *Aviation Sales Department,* 135 East 42nd Street, New York 17, N. Y.

TEXACO

LUBRICANTS AND FUELS FOR THE AVIATION INDUSTRY